



# KALMIOPSIS

Journal of the Native Plant Society of Oregon



Cone of gray pine (*Pinus sabiniana*)

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Upper left: No abscission layer forms between a gray pine cone and its peduncle, so cones not cut by squirrels remain on the tree until weathering off. No squirrels have found this tree in Central Point that was grown from seed collected by Ivan Skyrman near Blackwell Hill. The accumulation of cones for 16 years may weigh 100 lbs. on a branch, even more during winter when wet! Photo by Frank Callahan.

Upper right: The female spikelets (particularly the lowest ones) of *Carex limosa* usually dangle in this inverted position. Photo by Bruce Newhouse.

Lower left: North slope of Fairview Mountain, the site of William Baker's doctoral research, photographed in August 2008 by Rhoda Love.

Cover Photo: Cone of gray pine (*Pinus sabiniana*). Photo by Robert Korfhage, March 2009.

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# Discovering Gray Pine (*Pinus sabiniana*) in Oregon

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*“The tree is remarkable for its airy, widespread tropical appearance, which suggest a region of palms rather than cool pine woods. The sunbeams sift through even the leafiest trees with scarcely any interruption, and the weary, heated traveler finds little protection in their shade.”*

—John Muir (1894)

Until fairly recently, gray pine was believed to be restricted to California, where John Muir encountered it. But the first report of it in Oregon dates back to 1831, when David Douglas wrote to the Linnaean Society of his rediscovery of *Pinus sabiniana* in California. In his letter from San Juan Bautista, Douglas claimed to have collected this pine in 1826 in Oregon while looking for sugar pine (*Pinus lambertiana*) between the Columbia and Umpqua rivers (Griffin 1962). Unfortunately, Douglas lost most of his field notes and specimens when his canoe overturned in the Santiam River (Harvey 1947). Lacking notes and specimens, he was reluctant to report his original discovery of the new pine in Oregon until he found it again in California (Griffin 1962). Despite the delay in reporting it, Douglas clearly indicated that he had seen this pine before he found it in California, and the Umpqua region has suitable habitat for gray pine.

John Strong Newberry<sup>1</sup> (1857), naturalist on the 1855 Pacific Railroad Survey, described an Oregon distribution for *Pinus sabiniana*: “It was found by our party in the valleys of the coast ranges as far north as Fort Lane in Oregon.” Fort Lane was on the eastern flank of Blackwell Hill (between Central Point and Gold Hill in Jackson County), so his description may also include the Applegate Valley. Built in September 1853 for service in the Rogue River War, Fort Lane was abandoned three years later. Named for General

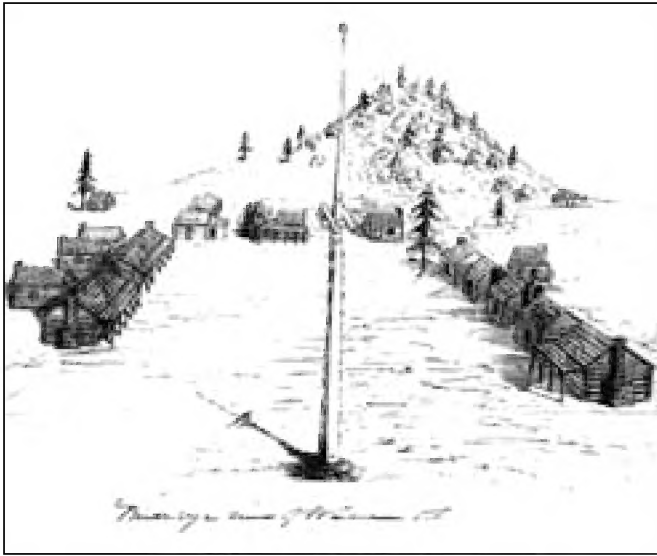
<sup>1</sup> John Strong Newberry (1822-1892) is recognized by Oregon botanists from species bearing his name in several genera (*Astragalus*, *Gentiana*, *Penstemon*, *Polygonum*, *Potentilla*), based on collections he sent to Asa Gray. Newberry Crater in central Oregon was named in his honor in 1903. Over all, he generated over 200 scientific papers and amassed a mineral and fossil collection of over 100,000 specimens.



The lone gray pine at Tolo, near the old Fort Lane site, displays the characteristic architecture of multiple upright leaders that are necessary to bear heavy clusters of cones. Photo by Robert Korfhage.

Joseph Lane<sup>2</sup> (1801-1881), the fort was constructed from local trees, principally pines (Tveskor and Cohen 2008). Surviving old pines near the fort site on Gold Ray Road include both ponderosa and gray pine.

<sup>2</sup> Joseph Lane came to Oregon in 1849; became the first territorial governor in 1859; was elected US Senator and in 1860 was a vice presidential candidate (running with Breckenridge). Lane County is named for him (McArthur 1965).



Artist's depiction of bird's eye view of Ft. Lane, circa 1855. Although the trees appear to be fir, they actually would have been ponderosa or gray pine. Reprinted from Tveskor and Cohen (2008).

## Documentation of Gray Pine in Oregon

Oliver Matthews (1892-1979), dendrologist and amateur botanist, created the first scientific documentation of *Pinus sabiniana* in Oregon. Matthews first learned of gray pine when civil engineer Earl Marshall told him of an old miner who lived about three miles above Ruch in the Applegate Valley in 1870 and came down to Ruch to gather gray pine seed to eat. Marshall corroborated this story with his own observation around 1917, of finding "eight or ten little trees scattered over say maybe a quarter of an acre, trees maybe 20 ft. tall, in a pasture southwest of Ruch. When he went back in 1925, the trees had been cut down, but the gray pine stumps were still there" (Matthews 1946). In 1940, Lee C. Port, District Ranger on the Rogue River National Forest, told Matthews about a knobcone pine near Gold Hill. Five years later, Matthews found the tree at Rock Point near Gold Hill, and discovered that it was a gray pine. On November 5, 1945, Matthews photographed the pine and collected leaves and cones, which he sent to Oregon herbaria for the first documentation of gray pine in Oregon. This tree was cut down by the Oregon State Highway Department on September 17, 1952, when it was 39 feet tall with a trunk diameter of 17 inches. A ring count showed that it was 33 years old, thus it was a seedling in 1919.

In 1955, Dan Rigel, a logger, found five gray pines west of Boswell Mountain (north of Sams Valley, see Oregon distribution map). Growing in association with stunted Oregon white oak on poor volcanic soils, the trees ranged in size from 45 to 80 feet tall and up to 3.5 feet in diameter.

In 1958 Ivan Skyрман collected seeds from six gray pine trees on east slope of Blackwell Hill near the Ft. Lane site (probably on his brother William's property). Years later, he noted that those trees had been cut for firewood along with most of other pines (Skyрман, pers. comm. 1985). Since then, a tree planted at his residence in Central Point has grown to become Oregon's Champion gray pine: 109 ft. tall and 4.25 ft. in diameter breast height (DBH), a testament to the fertility of soils in that part of the Rogue Valley.

Based on Matthews' herbarium specimens, Morton Peck (1961) included *Pinus sabiniana* in his *Manual of the Higher Plants of Oregon*; unfortunately, Peck got the location wrong ("one locality in eastern Josephine County"). Matthews collected his specimen in western Jackson County.

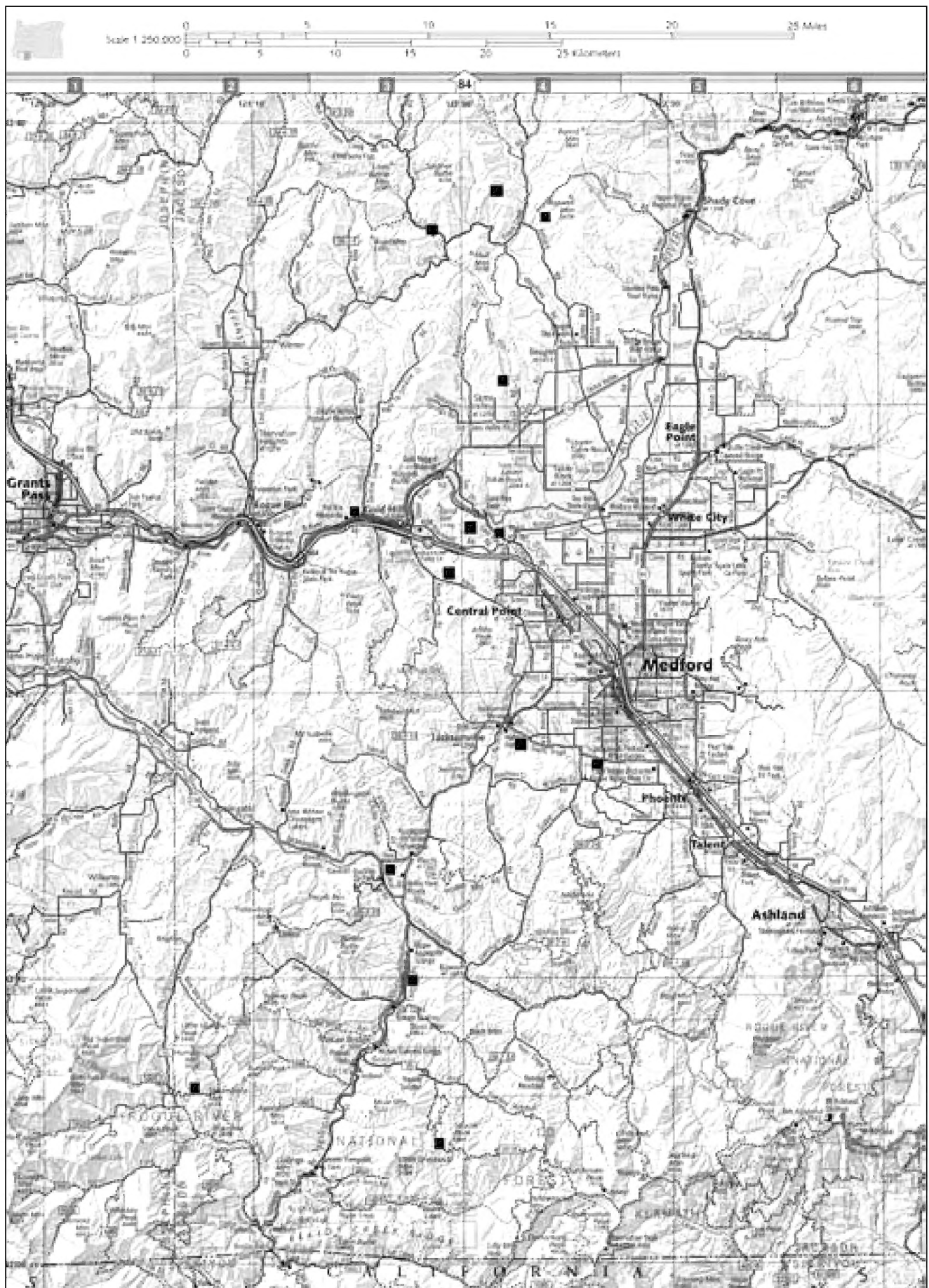
In 1970 I purchased 20 woodland acres south of Foley Lane and Interstate-5 between Gold Hill and Blackwell Hill in Jackson County. Soon after that I discovered gray pine on my property as well as the adjacent Hidden Valley Ranch (Callahan 2005). Most of the larger specimens were in Harris Gulch; one tree was 39 inches in diameter and 96 ft. tall. The larger trees had clear boles for 30 to 40 ft. I also found several large downed trees, the largest of which measured 55 in. DBH and was 136 ft. long; the ring count near the base was 166 years. Unfortunately, all of the trees over 14 in. DBH in this population were logged in the 1990s, along with the associated ponderosa pine<sup>3</sup>. Ring counts of those stumps ranged from 75 to 149 years. At this site, the gray pines appeared to be out-performing the ponderosa pines! At the time, the Morris brothers (Earl and LaRue, now deceased) requested that I not report these trees because they feared people trespassing on their property (883 acres). I respected their wishes, waiting until the brothers no longer owned the property to donate voucher specimens to the herbarium at Oregon State University. Around the same time, adjacent landowner John Mardon (1906-1994) said that he had cut a dozen or so gray pine for firewood from his south slope into Harris Gulch. Years later, Frank Lang visited the Harris Gulch site with me and we found only seven gray pine



First documented gray pine at Rock Point, west of Gold Hill, photographed and collected by Oliver Matthews. Photo courtesy of Oregon State University Archives.

<sup>3</sup> The largest ponderosa pine measured 48 inches DBH and 102 ft. tall, with a ring count of 189 years.



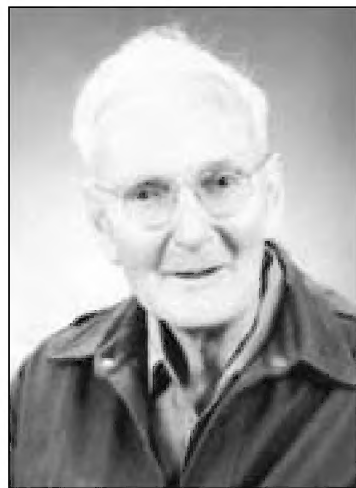


Known locations of gray pine in Jackson Co., Oregon. Map courtesy of Benchmark© maps.

trees on the slopes above the gulch. Since all the mature trees were logged, pine seedling recruitment has been poor. Seven trees currently produce cones with fertile seeds. Plant Oregon Nursery near Talent has added the species to their inventory of native trees for sale and Ogden Kellogg started a population on gabbro soils on his property at Gold Hill.

In 1975, after corresponding with Oliver Matthews for years, I visited him at a Salem rest home. Although in poor health, with failing eyesight and hearing, he was mentally sharp. Matthews began his story about gray pine with Earl Marshall and concluded with the rumors of gray pines up Carberry Creek and in the Applegate Valley. He garnered most of his information from miners and woodcutters, adding that “most...foresters don’t know the difference between a knobcone and a gray pine!” My experience

with reports from foresters at the Star Ranger District paralleled his; for several years the leads led to nothing but knobcone pine. My luck changed when I applied Oliver’s strategy and queried an elderly woodcutter instead. He replied, “Those gray-looking trees with cones the size of coconuts; hell yes, they grow here and also in the Redding area. The wood is hard to split, much like knobcone pine” (both trees have intertwined coarse fibers and rarely split in a straight plane). He indicated on my map where he had cut a stand of gray pine some ten years earlier. The next weekend, after traveling many dead-end spur roads, I found



Oregon dendrologist Oliver Matthews (1892-1979) first documented *Pinus sabiniana* in Oregon. He graduated from Willamette University in 1913 and supported Oregon herbaria (WILLU, OSC, ORE) with numerous collections. His records are archived at the Oregon State University Library. Photo courtesy of Oregon State University Archives.

an abandoned road that led to a rocky outcrop with 27 rotting stumps. Heavy cones around the stumps provided evidence that they were gray pine. One stump with high rosin content was in fair condition, and its four-foot diameter yielded an age guesstimate of 120 years. This site was near Burnt Peak-Kinney Mountain, above Carberry Creek, just as Oliver had predicted! (See Oregon distribution map on p. 3).

In 1976, I met with Jim Griffin, the gray pine authority in California, at Hastings Natural History Reservation (inland from Carmel, California) to discuss the distribution of gray pine in Oregon. I briefed him on the new range data, to which he replied, “I just wish I could have had your information when writing my PhD thesis and the *“Distribution of Forest Trees of California.”* He regretted that he did not have time to check out the Oregon rumors, even though he suspected that “If gray pine did grow in Oregon, the Medford-Grants Pass portion of the Rogue River Valley would certainly be appropriate habitat” (Griffin and Critchfield 1972). Although unable to personally verify locations reported outside California, Griffin should have acknowledged the

presence of gray pine in Oregon because he knew about Oliver Matthews’s voucher specimens.

In 1988, Dave Hoffer, a hunter, found a single gray pine on Little Grayback Mountain. Soon afterwards, Wayne Rolle (Forest Service botanist) and I walked the entire Slicker trail from Squaw Peak to Squaw Lakes in search of a second reported gray pine, to no avail. In 2003 I located the stump of a lone gray pine that Calvin Smith, another local hunter, discovered east of Eastside Road in the Applegate Valley the previous year (see Oregon distribution map). The stump, surrounded by numerous gray pine cones, was 32 inches in diameter, and I estimated its age at 76 years.

In 2007, Rick Givens, a local avid outdoorsman, noted several gray pines on an eastern ridge of Spignet Butte (west of Boswell Mtn). I searched the area and found about five trees that had been destroyed earlier by a forest fire. However, several trees remained on private property at the southern base of Spignet Butte, not far west of where Dan Rigel located five trees in the 1950s. In the same year I also found a single gray pine with two intact cones after the Hull Mountain fire near Rock Creek just north of Sams Valley. In 2008 I found two additional populations of gray pine in the foothills east of Jacksonville; one of which was growing with California buckeye (Callahan 2005). In October 2009 I found the first gray pine in Josephine County, along the Galice Road west of Merlin.

### Gray Pine Habitat

*“The form of the tree, as well as its foliage are peculiar, and readily serve to distinguish it from all other pines I have seen...It chooses, in preference, regions unoccupied by other trees, and is generally found scattered sparsely over rough and rocky surfaces, where almost no other plant would take root.”*  
—John Strong Newberry (1857).

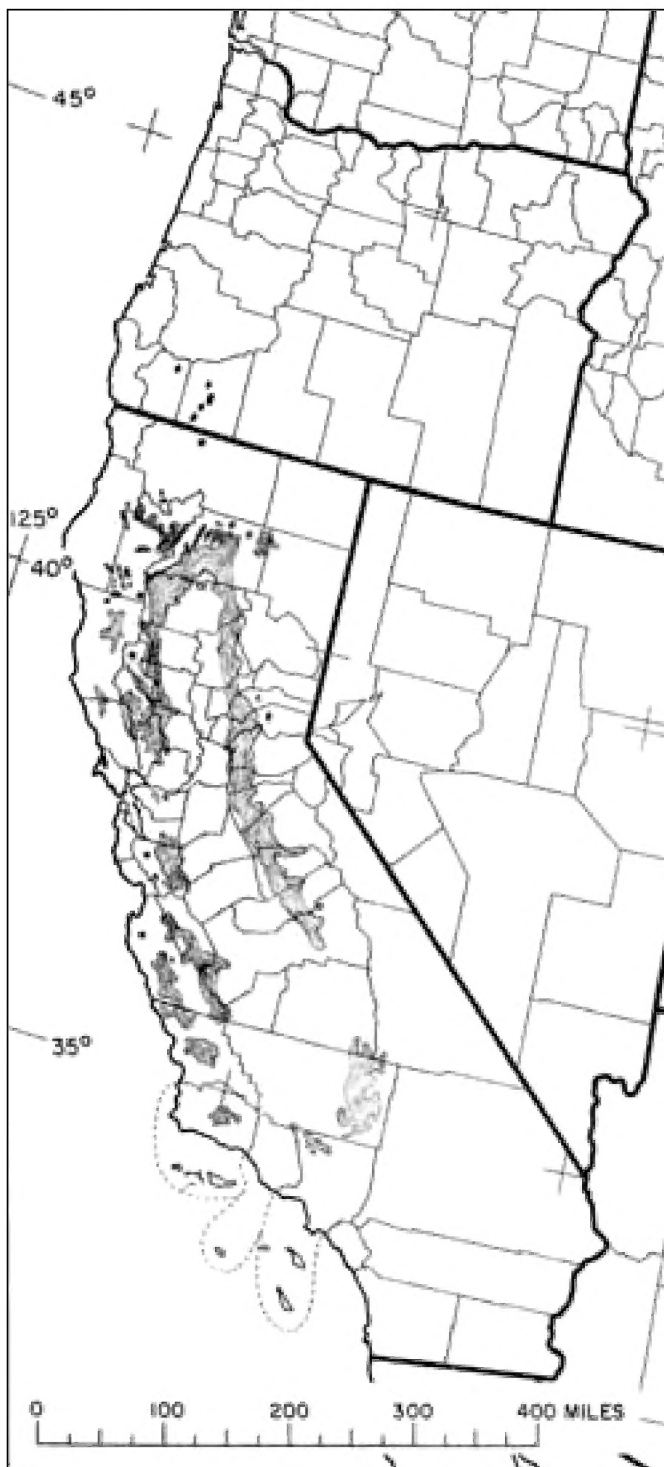
*“These trees [gray pine]...are seldom if ever seen in dense groves, but sparsely distributed over extensive areas - well on to one thousand miles of the lighter hilly lands of California and Oregon - they also inhabit some of the most utterly sterile, rough and rocky soils imaginable”*—Albert Kellogg (1882).

In Jackson County, gray pine grows on soils derived from a wide range of parent material including sandstone (Payne Cliff formation), ultramafic, volcanic, metavolcanic or metasedimentary rocks, and limestone. Generally functioning as a pioneer species in the foothills chaparral, gray pine may be a climax species on ultramafic, mafic, and calcareous soils, that are often shallow (low moisture storage capacity) and with mineral imbalances that limit plant growth.

Elevations of gray pine sites in Oregon range from 1,650 ft. (near Gold Hill) to 4,320 ft. (near Squaw Peak). Gray pine survives with as little as 10 inches annual precipitation (in California), giving it a competitive advantage over ponderosa pine and Pacific madrone in dry conditions. During the drought years of 1985 to 1994 (NOAA 2009), bark beetles decimated ponderosa pine populations and madrone suffered extensive dieback, while the gray pine prospered. Of the gray pine sites in Oregon, only the Rock Point site is near a weather station, which recorded 35 inches in 2003.

In Oregon, wedgeleaf ceanothus (*Ceanothus cuneatus*) grows with all fourteen populations of gray pine. Although this shrub also

grows with gray pine in California, it “is not a universal member of the *Pinus sabiniana* communities, ranging beyond the pine to the north and south” (Griffin 1962). Like Oregon white oak (*Quercus garryana*), Brewers oak (*Q. garryana* var. *breweri*) and incense cedar (*Calocedrus decurrens*), gray pine is an incidental component of foothills chaparral. Chaparral comes from Spanish, meaning “a place of scrub oak” which has expanded to include other shrubs, including wedgeleaf ceanothus, whiteleaf manzanita (*Arctostaphylos viscida*), Fremont silktassel (*Garrya fremontii*), Yerba Santa (*Eriodictyon californicum*),



Native distribution of gray pine in Oregon and California. Map adapted from Atlas of United States Trees (Little 1971).

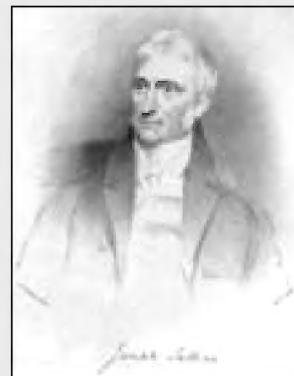
### Is the Name *sabiniana* or *sabineana*?

The name has been *Pinus sabiniana* since David Douglas named the pine to honor Joseph Sabine, honorary secretary of the Royal Horticultural Society that sent Douglas to collect plants in North America. According to McKelvey (1991), a dedication was added to Douglas' description (Trans. Linn. Soc. London 16:747-750, 1833): “The active and enlightened zeal which Joseph Sabine, Esq. has ever taken ... for the introduction of new choice and useful plants ... induces me to affix his name to one of the most beautiful objects of creation ...,” making it clear that Douglas was not honoring Joseph's brother Edward, as Edward apparently maintained after Douglas' death.

In 2001, Farjon listed gray pine in *World Checklist and Bibliography of Conifers* as “*Pinus sabineana* Douglas ex D. Don in Lambert,” followed by *sabiniana*, indicating that he considered the latter a synonym, with no explanation for the name change. In the second edition of his book on pines, Farjon (2005) wrote, “As this species was named after the former President of the Royal Society Sir Edward Sabine (1788-1883) [Farjon is in error here] the original misspelling “sabiniana” by David Douglas should be corrected under the rules of nomenclature.” The change to *sabineana* was quickly adopted by internet sites, including the Integrated Taxonomic Information System's 2009 website ([www.catalogueoflife.org](http://www.catalogueoflife.org)), which listed Farjon's Conifer Database as the source of “latest taxonomic scrutiny.”

However, Article 60 of the International Code of Botanical Nomenclature (ICBN) states that the original spelling of a name or epithet is to be retained, with certain exceptions that do not appear to be relevant here. In addition, the idea that the spelling of *sabiniana* was a typographical or orthographical error seems most unlikely. The authors probably followed a frequent custom of the time and simply created a Latin form for Joseph Sabine's surname, *Sabinius*. Because Article 60C.2 of the ICBN allows for an “ana” ending if the person's name ends in a vowel, Farjon's epithet *sabineana* is a properly constructed name, but it isn't needed.

Interestingly, Farjon uses the original spelling, *P. sabiniana*, in his latest book (2008). Farjon's epithet and its citation are not included in the International Plant Names Index (<http://www.ipni.org/index.html>). Clearly, *Pinus sabiniana* Doug. ex Don in Lambert should be considered the correct scientific name for gray pine. —Frank Lang



Joseph Sabine (1770-1837), patron and friend of David Douglas. Portrait by E. U. Eddis, lithograph printed by Lefevre & Kohler, published by Thomas McLean, 1835. ©The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

mountain mahogany (*Cercocarpus betuloides* var. *macrourus*), poison oak (*Toxicodendron diversilobum*), hollyleaf redberry (*Rhamnus ilicifolia*), and deer brush (*Ceanothus integerrimus*). These shrubs represent a northern extension of the California Floristic Province, and are commonly referred to as foothills chaparral, although both poison oak and wedgeleaf ceanothus also occur on the valley floor (in the basin chaparral type). Antelope bitterbrush (*Purshia tridentata*) grows with gray pine at Rock Point (Gold Hill).

Other trees found with gray pine in Jackson County include Canyon live oak (*Quercus chrysolepis*), California black oak (*Q. kelloggii*), Pacific ponderosa pine (*P. ponderosa* ssp. *benthamiana*), knobcone pine (*P. attenuata*), Douglas fir (*Pseudotsuga menziesii*), sugar pine (*P. lambertiana*), Pacific madrone (*Arbutus menziesii*) and California buckeye (*Aesculus californica*). Because gray pine is shade intolerant, it usually grows on shallow or rocky soils in the ecotone between dense conifer or madrone forests and open grasslands or chaparral. Native grasses common on these sites include Oregon fescue (*Festuca roemerii*), Chinook brome (*Bromus laevipes*) and Lemmon's needlegrass (*Achnatherum lemmonii*).

The *Ceanothus*-chaparral communities are important in Jackson County because they form the climax plant community on xeric slopes, protecting watersheds from soil erosion and providing habitat for numerous animal species (Detling 1961, Keeley 1975). Gray pine

is only a minor component of chaparral communities, and is entirely absent in the foothills and basins east of the Rogue Valley, including the extensive populations of wedgeleaf ceanothus on the south slopes of both Table Rocks. It ranges onto the Cascadian volcanic soils only where geologic formations of the Klamath and Cascade mountains merge at the north end of the county (Boswell Mtn.). Ring counts of old wedgeleaf ceanothus indicate a maximum life expectancy of about 50 years. Wedgeleaf ceanothus seeds germinate with or without fire, especially on bare or disturbed mineral soils, although fires may completely replace populations. Even mature gray pine trees cast so little shade that it does not inhibit a dense subcanopy of ceanothus. Both species are deep rooted and the pine may benefit from nitrogen contributed by the shrub. Gray pine and wedgeleaf ceanothus are xeric thermophiles, tolerating drought and high temperatures severe enough to kill associated chaparral and oak species.

Gray pine was probably a component of the basin chaparral that was widespread in the Rogue Valley when Europeans arrived; Medford was once called "Chaparral City" (John Mardon, pers. comm.). The gray pine at Tolo (Gold Ray Road) is at the edge of this basin. Clearing land for agriculture and cutting trees for lumber and firewood during the 1850s eliminated most of the trees in the valley, especially near the railroad.

Likewise, the current distribution of gray pine in California foothills may be a only a portion of its natural range. Historical records indicate that gray pine once grew in the valleys: "on the borders and at the head of the Sacramento Valley, but little above the level of tide water" (Newberry 1857). Small populations of gray pine growing in chaparral stands on the floor of the Sacramento Valley between Dunnigan and Arbuckle may be remnants of a distribution that was more widespread prior to frequent burning (Watts 1959). In the Great Central Valley, "Indians set most of the fires that burned nearly every year. Fire was the brush that painted this landscape. It surged from the valley grasslands below. More fires crept into the foothills from the ponderosa pine forests on the mountains above, and others started in the foothills" (Bonnicksen 2000). Because the chaparral/gray pine type provided little forage for cattle or sheep, stockmen converted vast areas of the Sacramento Valley to annual grasslands; the practice was formally endorsed by University of California range specialist Arthur Sampson: "Controlled burn ignited by the



Gray pine with view of Mount McLoughlin in background and Oregon white oak to the right. This is the last remaining tree from a population on the John Mardon property, which lies on an east-west ridge south of Foley Lane near Gold Hill. Photo by Frank Callahan.





The “Tolo tree” bears a seed tree sign; four seedlings have taken root nearby. Photo by Frank Callahan.

edge method...The tall trees are digger pine, a worthless species on range land” (Sampson and Schultz 1956).

Despite its scarcity, gray pine in valley habitats give an indication of the species’ potential maximum size. The record-setting trees listed in the table below were recorded from valley habitats in six California counties.

In 1888, John Gill Lemmon photographed a magnificent specimen in the foothills (ca. 2500 ft. elev.) near Auburn, California, which he estimated to be 180 feet tall. Lemmon may have overestimated the height, but without a diameter figure, it is difficult to scale the height of the tree. The tree in Santa Clara County (nominated by the author in 1991) is ranked as the largest living gray pine.

In Oregon, gray pine’s growth on fertile, lowland (agricultural) soils is amazing. It tolerates extremes of heat and drought better than ponderosa pine, which grows better in the foothills (above 2,500 ft.). The Oregon state champion tree, planted in rich bottomland soil 50 years ago, has grown to be almost as large as the tallest gray pine (102 ft.) that Griffin measured in California. In contrast, on poorly developed soil barely three feet deep, it took 166 years for the Harris Gulch tree to grow to 135 feet tall (and 4 ft. 7 in. DBH). The largest individuals are not always the oldest because environmental factors (e.g., soils, climate, fire frequency) play a major role. The oldest reported gray pines range from 175 years (Lieberg 1902, Shin 1911) to 200 years (Biswell and Agee 1999, Powers 1990). Compared to other Western pines, gray pine is not long-lived; mostly due to the frequency of wildfires (Griffin 1962). Fires set by Native Americans



Tallest ever recorded gray pine tree, published by John Gill Lemmon (1888). Caption reads “Gray-leaf Pine near Auburn, Cal.; 180 feet high; altitude, 2,500 feet.” Photo by Britton & Rey, San Francisco.

in the valleys often raged into the foothills, which may be why John Muir (1894) recorded apparently full-grown specimens of gray pine only 40 to 50 feet tall and two to three feet in diameter, barely half the size of current records.

**American Forest National Champion Trees, Gray Pine** ([www.americanforests.org/resources/bigtrees/](http://www.americanforests.org/resources/bigtrees/))

Year	Circumference (in.)	Diameter (ft. in.)	Height (ft.)	Crown spread (ft.)	Points	California County
1960	190	5'	155	60	375	Fresno
1972	199	5'3"	160	80	379	Fresno
1984	192	5'1"	76	85	289	Tehama
1986	186	4'11"	161	79	367	Shasta
1991	222	5'11"	140	120	382	Santa Clara
2001	176	4'8"	120	77	315	Tulare
2005	200	5'4"	126	86	348	Kern

## Friends of Gray Pine

Gray pine owes its wide distribution to birds belonging to the group known as corvids. Its heavy seed with a rudimentary wing is not wind dispersed like smaller-seeded pines; seeds normally fall directly under the canopy of the parent tree. Both Steller's and Scrub Jays are "hoarding granivores," birds that collect and cache seeds to eat later. Even though they are experts in relocating their caches, there are always some caches that are missed or forgotten; those seeds germinate and grow into seedlings. Jays hide their caches about half an inch below the mineral soil surface, assuring the seed some protection from dehydration while it undergoes winter stratification. My informal name for Scrub Jay is "planter of

the pine." Scrub Jays live in the chaparral and woodland openings, a range sympatric with gray pine, and do not migrate; obtaining the water they need from their diet.

In contrast, Steller's Jays occupy forests and denser woodlands, ranging from below montane timberline down into the foothills (rarely ranging into the basins) and cover great distances in search of food. In summer, the best places to see Steller's Jays is near water sources, which are rare in chaparral types. Because it is poorly adapted to live in chaparral, Steller's Jay is normally just a transitory visitor, usually during the fall.

The distribution of the gray pine as widely scattered clusters reflects the habits of the two birds: Steller's Jays transport seeds great distances, often out of binocular range, while Scrub Jays usually

### Common Names

Despite numerous common names (digger, gray, ghost, foothills, Sabine, grayleaf, bull, squaw, smoky, or pineapple pine), only one published scientific name exists for this species: *Pinus sabiniana*. David Douglas named it for his friend and patron Joseph Sabine (1770-1837), secretary of the Horticultural Society of London, who was an attorney as well as a naturalist (Little 1979). In a letter to Sabine from San Juan [Bautista], Upper California, on 4 February 1831, Douglas extolled his "Great Prickly-Coned Pine" as a "noble new species ... one of the most beautiful objects of nature...[that will] flourish when we shall cease to be, when we are gone forever." Douglas wrote a brief Latin description, but did not note the location from which he secured his specimens (Bryant 1929, Griffin 1964a). David Don prepared a full Latin diagnosis and designated a type specimen (Lambert 1832).

This pine was so important to the native people of western North America that each tribal language had a name for it (Hinton 1992).

Tribe	Common Name
Amchumawi	tujhaloé
Chimariko	hatcho
Karuk	axyúsip
Klamath	gapga
Maidu	towáni
Miwok	sakky
Mono	tunah
Patwin	tuwa
Wappo	náyo

Historically, the most widely used common name has been digger pine. "Digger" is a pejorative term used by settlers to collectively describe the native people of central California, who dug roots and bulbs and used the seeds, sap, cones branches, leaves and bark of the pine. The native people resented the European settlers' name for them. In 1924, the Mewuk Indian Tribe at Ione, California, soaked an effigy labeled "Digger" with gasoline and torched it, while they "danced and chanted, indicating joy that the hated name has passed" (Hinton 1992). Lemmon (1888) objected to the name digger pine: "the uncouth name for this interesting tree should be discontinued for one [a name] which must always be characteristic, as it is derived from its most striking character, to wit: its singular, long, grayish

leaves." Lanner (1999) agreed with Lemmon: "because the term 'Digger' is comparable in disrespect for Native Americans to the similar sounding term for African Americans, and dendrology is under no obligation to prolong historic insults, gray pine is a better common name."



An isotype of *Pinus sabiniana* Douglas ex D. Don, collected by David Douglas 1833, locality Nova California, accessioned as Herbarium Benthamianum in 1854. Scanned image courtesy of The Board of Trustees of the Royal Botanic Gardens, Kew, reproduced with permission.

cache seed within a mile of where it was produced. Both birds cache seeds in loose, rocky soils of open sites or chaparral. Steller's Jays fly many miles to cache seeds, so probably planted the small, widely scattered gray pine populations in Oregon. Scrub Jays, with their local dispersal, enlarge gray pine populations around the isolated trees planted by Steller's Jays. Because the seed is so large, sometimes the jays place a single seed in a cache; multiple-seed caches that are forgotten can result in clusters of gray pine seedlings.

### Enemies of Gray Pine: Fire, Logging, and Squirrels

Like most chaparral species, gray pine is highly combustible; fire usually destroys or severely damages it. Although gray pine does not resprout, under natural conditions it rapidly re-colonizes burned sites, usually with the help of the jays. I watched both jays caching gray pine seed after the Montgomery Creek Fire in northern California; almost all subsequent pine seedlings appeared to be the result of their efforts. Frequent wildfires eliminate gray pine populations by preventing seedling establishment. Since fire regulations ended widespread burning of foothill grasslands, gray pine has been re-colonizing its former habitat in the Sacramento Valley, especially in the Redding area.

When European settlers arrived in the mid-1800s, the Harris Gulch site in Oregon supported large, old growth pine, oak, and madrone, interspersed with openings of bunchgrass and chaparral. Oral history related by descendants of these early settlers indicates that all fires in that area since that time have been human-caused. Bill David, retired forester, and Ansel Rosencrans, a local farmer, witnessed the last fire (in 1945) that started on the Foley Brothers' ranch near Gold Hill. Two boys using a rockpile for target practice created sparks that ignited dry grass. Hot winds rapidly swept the fire into nearby hills. Despite extremely dry conditions, most of the old growth pines (gray and ponderosa) and oaks suffered only basal scarring. Upslope, the fire completely consumed many younger pines and almost all the madrone and manzanita, except those growing in rocky areas with scant vegetation (typical gray pine habitat). Afterwards, madrone and oak resprouted from basal buds, whiteleaf manzanita and wedgeleaf ceanothus germinated from the soil seed bank, and the grasses simply grew back from roots or rhizomes.

Most of the larger gray pine trees survived the 1945 fire with just basal scars. But the 1980s brought a drought, followed by an infestation of bark beetles, which led to logging of all the conifers in Harris Gulch that had survived the fire. Non-merchantable trees were cut and left on the ground. My property was not logged, so these gray pines can furnish seed to restore the surrounding areas. Unfortunately, gray squirrels severely reduce the availability of seed; numerous shredded cones are still lying around the pine stumps.

In addition to shredding mature cones for the seeds, Western gray squirrel (*Sciurus griseus*) destroys both immature cones and entire seed crops by cutting and feeding on the branches (Berry 1914, Griffin 1962). Although Western gray squirrel populations in Oregon and Washington are reported to be in decline (Headley and Sells 2005), gray squirrels in southwestern Oregon have proliferated, benefiting from their association with humans, who set up feeding stations and kill predators. Its main predator, the fisher (*Martes pennanti*), has been nearly extirpated from Oregon due to habitat loss and trapping. Gray squirrels do not cache gray



Left, gray pine cone from Harris Gulch. Right, a gray pine cone after a gray squirrel chewed off most the scales and ate all of the seeds. A squirrel can strip one of these sturdy cones in about 20 minutes. Photo by Robert Korfhage.

pine seeds or cones; but convert the cones to gnawed "cobs." In addition, they often raid bird caches, which not only deprives the jays, but also hampers seedling recruitment.

### Fossil Origins of Gray Pine and How It Came to Oregon

The fossil pine *Pinus pieperi* Dorf. is either the progenitor or identical to gray pine (Ledig 1999). It dates to early and late Miocene and Pliocene (23.8 to 1.8 million years ago) and occurred south of the present range of gray pine, ranging from the Los Angeles basin north of the San Gabriel Mountains to Palmdale (Griffin 1962). Northward migration apparently occurred after or during the late Pleistocene; gray pine may have been eliminated from southern California either by warmer winter temperatures or by competition with elements of the chaparral formation, which expanded during the Holocene (Ledig 1999). Based on genetic similarity of disjunct populations, Ledig (1999) thought that gray pine formed a continuous population throughout the Great Central Valley 12 to 8 thousand years ago. Then, during the warmer, drier Xerothermic (8,500 to 3,000 years ago), it ascended into the foothills while the chaparral community expanded rapidly in the foothills and basins, fragmenting the gray pine distribution.

During this period, gray pine may have migrated from the Sacramento Valley northward into Oregon, capturing habitat formerly held by Douglas fir and ponderosa pine. In northern California, gray pine currently grows on the south slope of Cottonwood Peak in the Ash Creek drainage west of Interstate 5. The next major population to the south is at the Forks of the Salmon River in Siskiyou County (Plummer Creek). The gap between Squaw Butte and Plummer Creek is 53 miles. Along the

Salmon and Klamath River canyons in the Klamath Mountains in northern California, the simplest path north is over Cook and Green Pass (4,750 ft.) a few miles south of Applegate Reservoir in Oregon. Gray pine at Squaw Peak (northeast of Applegate Reservoir) is only 430 feet lower than that pass. During the hot, dry Holocene and the subsequent gradual cooling period, there was a period of more than 4,000 years in which conditions would have favored range expansion. Pinyon Jays, so well adapted to deserts, may have served to plant the pine increasingly northward. Both the Pinyon and Steller's Jays can fly over 12,000 feet, so none of

the mountains passes along this route would present a barrier.

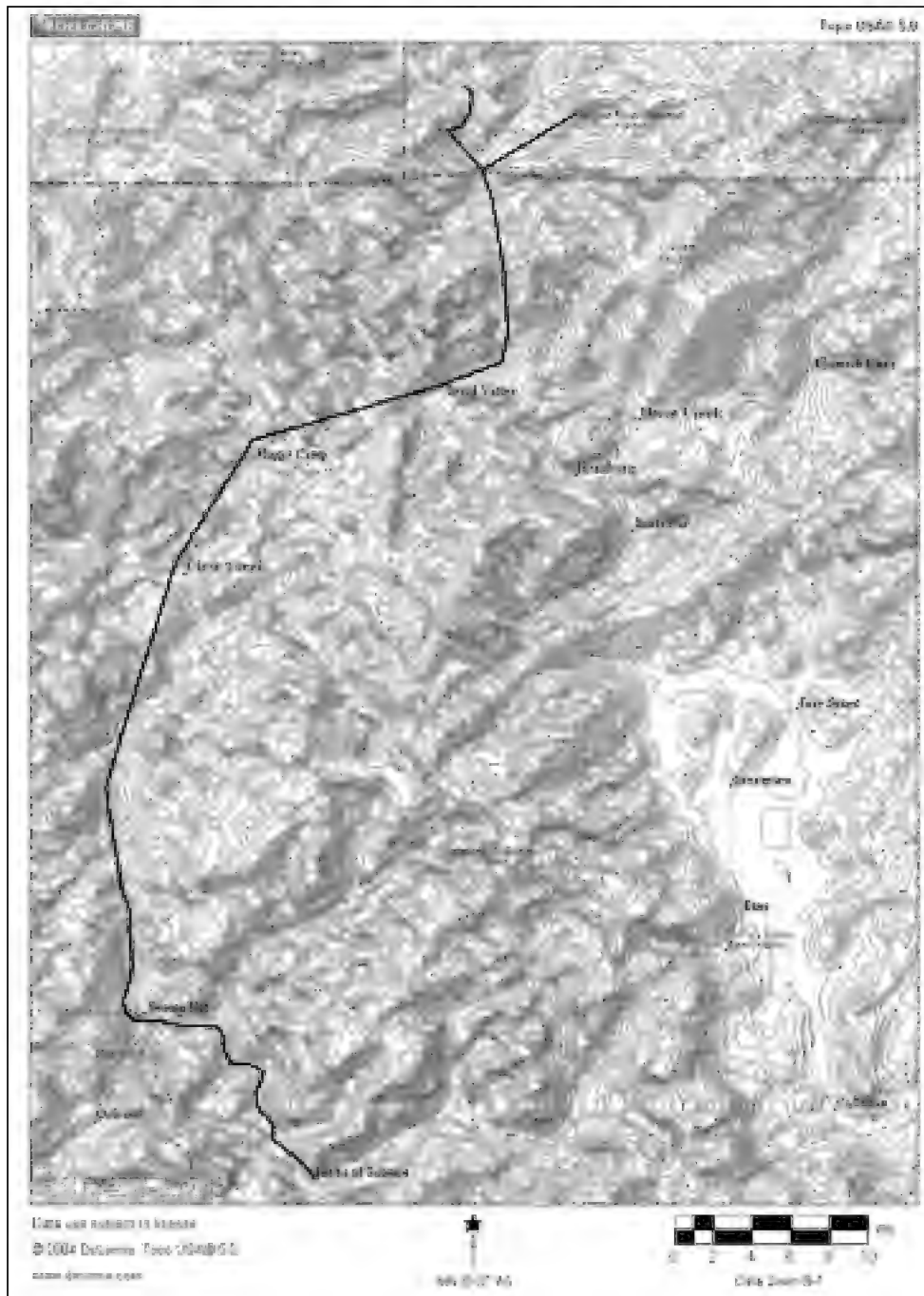
During the same period, the Great Basin species, Western juniper (*Juniperus occidentalis*), moved westward into the rain shadow of the Klamath Mountains. It is still abundant along the southeastern portions of the Rogue Valley (near Emigrant Lake) and to the southwest of the Siskiyou summit. Continuing across the Oregon/California border, it occupies a large area of distribution in the Klamath River canyon all the way south to the town of Callahan. These extensive populations of juniper surrounding the Scott and Shasta valleys are almost all associated

with wedgeleaf ceanothus. So why is the gray pine absent from this region? On ultramafic soils, it ranges as far north as Pollard Flat in the Sacramento River canyon. The northern limitation may be competition from other conifers under mesic conditions (*i.e.*, this region is wet enough to support populations of Port Orford cedar (*Chamaecyparis lawsoniana*)). The warmer geologic period ended about 3,800 years ago, and the cooler, wetter climate that followed gave the advantage to other conifers over chaparral species, which gradually diminished to present levels (Daniels *et al.* 2005). In particular, Douglas fir and ponderosa pine reclaimed lost habitat, closing gray pine's former passageway from the Forks of the Salmon River to Cook and Green Pass. Current climate change may reverse the trend and favor chaparral-gray pine communities.

### Gray Needles, Big Cones, and Gigantic Seeds

*"Scarcely in any sense a beautiful tree, offering no comfort of shade to the inexperienced wayfarer who, dusty and sun-bitten, seeks its protection, scorned too, by the lumbermen, it is nevertheless the most interesting and picturesque tree of the foothills on account of its scattered growth, its thin gray cloud of foliage, its variety of branching and its burden of massive cones"* (Jepson 1910).

Gray pine's "color signature" is so obvious that trees can be identified on GoogleEarth® images, even the "green trees" reported by Steve Edwards from Lamont Meadows,



Possible migration route of gray pine from Forks of Salmon north to the Klamath River canyon and over Cook and Green Pass into Oregon. The distance in air miles between the two sites is 53 miles. Birds may have flown a direct route instead of the river canyons. Gray pine seed is ripe in November, but cones open as late as March at Forks of Salmon, providing the jays with food for eating and for caching. Map prepared by Robert Korfhage using mapping program 2004 DeLorme Topo USA®.





The three heaviest pine cones in the western US: top left, gray pine (*Pinus sabiniana*) cone, note long peduncle with a 90 degree bend which allows the cone to hang vertically and thick central pith which was used as food by Native Americans; top right, Coulter pine (*Pinus coulteri*), note the narrower pith, short peduncle and asymmetrical cone base; bottom center, the smaller cone of Torrey pine (*Pinus torreyana*) with flat cone base and medium length peduncle. Photo by Robert Korfhage.

California (Edwards 1997). The secret to gray pine's soft ghostly appearance is its leaf surface. Unlike Colorado blue spruce needles that are coated with wax over the entire surface, gray pine concentrates highly reflective wax around large leaf stomata. Waxy antechambers reduce transpirational water loss from stomata under severe hot-dry conditions by about two thirds, but hinder the rate of photosynthesis by only one third (Jeffrey *et al.* 1971).

Gray pine's drooping needles, 6 to 16 inches long, cluster in fascicles of three that may persist for four years. Because gray pine needles are less concentrated on the branch (35 fascicles in

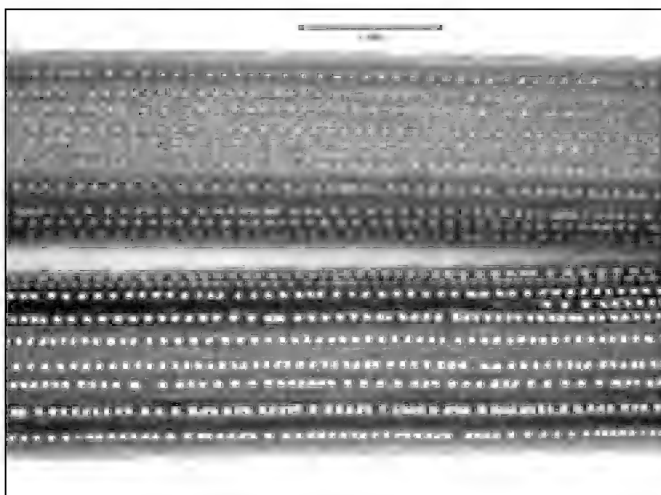
5 inches), compared to Pacific ponderosa pine (85 fascicles in 5 inches), more light penetrates the crown, creating a more open appearance. Sunlight for photosynthesis reaches needles of inner branches of gray pine, compensating for the scanty arrangement of needles.

The main trunk of gray pine divides early into the distinctive upright branches required to support the weight of the cones. A cluster of green cones in a whorl may weigh as much as 20 pounds (4 to 4.5 pounds per cone). Without substantially strengthening the branching system (as in Coulter pine), only a vertical branching system can bear this much weight. Multiple, heavily-weighted leaders make the tree highly vulnerable to wind shearing, which is how most old gray pines meet their demise. As Ron Lanner (1999) observed, "Forked and tilted black trunks and wispy, ghost like foliage immediately signify gray pine. Many lean and tilt this way and that, creating the suspicion of a drunken forest staggering as it ascends the oak studded foothills."

However, among the three big-cone pines, Torrey, Coulter and gray, the latter

has by far the widest distribution. Gray pine compensates for a short lifespan by consistently producing seed and tolerating a wider range of soils and climatic conditions than other pines. Perhaps because pollen can be blown for many miles, or because of self pollination, even isolated gray pines produce viable seed. The single tree at Tolo tested at 65% filled seeds, compared to the multiple-tree sites in Harris Gulch with 98% filled seed. Unlike most pines, "isolated single trees of grey pine planted in the Crimea produced full seed of high quality" (Podgorny and Smirnova 1984).

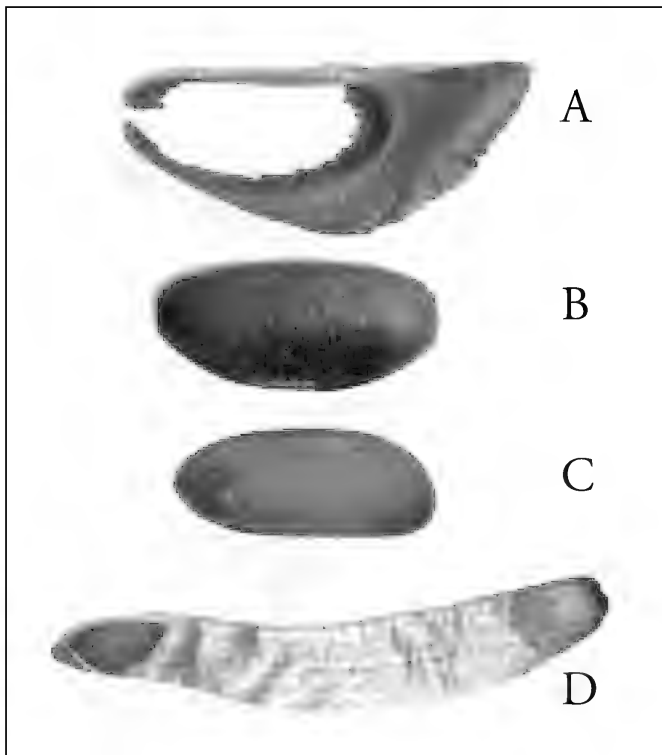
Cones of Oregon gray pine are similar in size to cones of the



Needle surface of Pacific ponderosa pine (top) exhibiting fine stomata bands with low reflectivity compared with gray pine (bottom) with prominent stomata bands of high reflectivity that give this pine its gray color signature. Photo by Cindy Roché.



Peduncles that bore cones persist with a small rosette of cone scales after the cones drop. Because there is no abscission layer, cones weather off after many years. Photo by Robert Korfhage.



A) With only a vestigial wing, the seed of gray pine (*Pinus sabiniana*) is not aerodynamic, having a low area to mass ratio; B) Seed of gray pine from Oregon; C) Seed of bigcone piñon (*Pinus maximartinezii*) from Mexico, formerly the largest known seed in the genus *Pinus*; D) Seed of Guadalupe Island pine (*Pinus radiata* var. *binata*) from Guadalupe Island, Baja California Norte, showing a highly efficient wing. Photo by Robert Korfhage.

North Coast-Klamath Range, which are significantly larger than cones throughout the Sierra Nevada foothills (Griffin 1964b). Oregon's trees produce cones up to 12 inches long and 8 inches wide. Cones are pollinated in early spring, and require two years to reach maturity, in late fall. Even though the number of trees in Jackson County is small, within each population, cones vary greatly in size and shape. This variation and the conservation of alleles (gene variants) during its migration northward (Ledig 1999) supports the idea that our populations may be remnants of a formerly large population, rather than extreme outliers migrating from a distant population.

Seeds produced by Oregon gray pine are about the same size as those at Forks of the Salmon, the possible starting point for northward migration into Oregon. The largest Oregon seed (without wing) was 1 3/8 inch long and 9/16 inch wide, which is the largest seed known in the genus *Pinus*. Like Torrey pine, gray pine delays seed dispersal; seeds collected from five-year-old cones germinated well after stratification (McMaster and Zedler 1981). Farris (1992) found from 61 to 188 seeds per cone, similar to my counts.

In food value, gray pine seeds are comparable to commercial pine nuts, Italian stone pine (*P. pinea*). Gray pine seeds are 30% protein, 60% fat and 9% carbohydrate, compared to stone pine at 34% protein, 48% fat and 7% carbohydrate (Lanner 1981).

### Ethnobotany

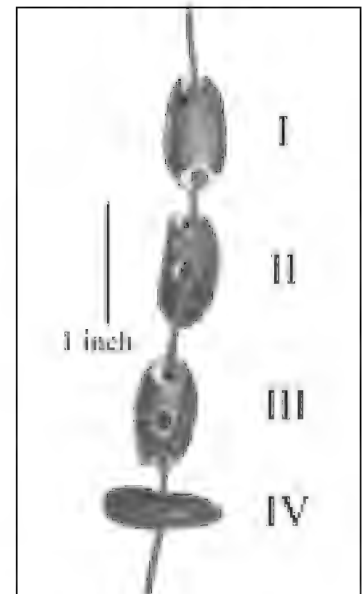
Native Americans in California relied heavily on gray pine, utilizing almost every part of the tree. In Oregon, one of the more interesting

discoveries were the pine beads excavated in 1932 by Dr. Luther Cressman at a site south of Gold Hill in Jackson County:

*"The richest burial found was that of a child approximately eight years of age; within this burial were found three types of marine shells: hundreds of Olivella, some Glycymeris and four pieces of Abalone. Also found were the hulls of Digger Pine seeds, of which some were partially charred. The pinenut hulls were strung together to form ornaments, which were found on the wrists and thorax of the buried child."* (Ferillini 1989).

Carbon-14 dating of other artifacts showed that the site was 3,000 to 1,000 years old; the Gold Hill people appeared to be ancestors of the historic Takelma (Ferillini 1989). These beads were unusual in that they were drilled laterally (cross-wise through the middle, type IV in the photo), a style that has been found at only two sites: Gold Hill and the Nomlaki site in Tehama County, California. The Nomlaki site contained a mix of longitudinal, oblique and lateral beads (type I, II and IV in the photo) (Farris 1992).

Gray pine seeds were widely traded among tribes, but to what extent were beads manufactured on the site? If laterally-drilled beads were traded, then they should have been found at other excavations, but they have not. The Gold Hill tribe may have developed an endemic style of bead manufacture using the nearby stands of gray pine, but did not trade them because quantities were so limited. Gray pine seeds were widely traded in Coos, Curry, Josephine, and Lake counties. A single gray pine in Josephine Co. is the only gray pine population found outside Jackson County, making it unlikely that tribes in Oregon planted gray pine seeds.



Beads crafted by Native Americans from gray pine seeds differed in how they were drilled for stringing: from top to bottom, longitudinally (I), obliquely (II), longitudinally with a center hole (III), and laterally (IV). Bead styles recreated by Frank Callahan.

### Gray Pine Cultivation – Grow Your Own

The few gray pine populations still present in the natural vegetation of Jackson County deserve protection, and could be augmented by planting<sup>4</sup>. Gray pine is a good choice for drought-tolerant home landscaping; examples can be seen in Grants Pass and various locations in Jackson County, including a gray pine planted along Interstate-5 at Mountain Avenue in Ashland. This lacey gray-leaved pine is a handsome accent in the garden and other plants can prosper in its light shade. Take care, though, as falling cones can be dangerous when dislodged by high winds!

<sup>4</sup> For seeds, germination requirements, availability of planting stock, contact the author.

## In Memoriam

Jim Griffin (1931-2004)

This article is dedicated to Jim Griffin, whose passion for *Pinus sabiniana* laid the groundwork for my story. I met Jim in 1976 and found that we shared an enthusiasm for locating big trees; together, we nominated two trees that became national champions (Coulter pine and bristlecone fir). We also compared notes on the idiosyncrasies of gray pine: a tree with tropical characteristics that can survive temperatures down to minus 30° F and far more successful than its two closest relatives, Coulter and Torrey pine.

James Richard Griffin, always known as Jim, grew up on a family farm in Watsonville, California, a town known for its agriculture. Jim became a botanist either because early years of farm work taught him that there were easier ways to make a living or because his father (Graydon G. Griffin) was a botany student of Willis Jepson. Either way, Jim majored in botany at the University of California, Berkeley (BS, 1952; MS, 1958; and PhD, 1962; "Intraspecific Variation in *Pinus sabiniana* Dougl."). During his college years, Jim met Joan Roberts and the two were married on 5 June 1957. Joan always ribbed him about marrying her for the pines on her property, which was located at Weimar, California, in the gray pine zone. In the summers of 1957 and 1958 Jim worked for the Six Rivers National Forest in Salyer, Trinity County, and in 1959 he worked in the Redwoods, at Weott. In 1960 he was a teaching assistant for Dr. Bob Sweeney at a San Francisco State botany class, held at Sagehen Creek, near Truckee. Between 1962



Jim and Joan Griffin, 7 November 1995. Photo courtesy of Joan Griffin.

and 1966 (except for one summer), Jim worked for Doug Roy at the USFS Range and Experiment station, Redding, a gray pine hotspot. During the summer of 1965 Jim and Joan went to Washington, DC, to work for Dr. Elbert L. Little, Jr., Chief Dendrologist for the USDA Forest Service. This was Jim's only employment outside of California, about which Joan commented "that was enough." In the fall of 1966 Jim began teaching and doing research at Hastings Natural History Reservation, Carmel Valley, for the Museum of Vertebrate Zoology, Berkeley, a position he held for 28 years. Joan taught grades K-6 at Hastings, noting that "Hastings was a 200-acre playground for our kids, who grew up without television." Today, son Andrew is an organic farmer on the Griffin family farm and daughter Ruth, like her mother, is a teacher (math tutor). Jim retired in 1994 and returned to Weimar. Sadly, he was diagnosed with Alzheimer's disease, and died in January 2004. We miss him, but are grateful for his botanical contributions.

## Acknowledgements

I would like to thank the following individuals for their suggestions, contributions, criticisms, and research assistance for this article: Frank A. Lang and Cindy Roché who assisted me throughout the process; Oregon State University Herbarium and Library, Aaron Liston and Richard R. Halse at Oregon State University; Andrew S. Doran at the herbarium at University of California, Berkeley; Stewart James at Southern Oregon University; Don Todd for information on ethnobotany; and especially Joan Griffin, who personally delivered Jim's reference material and PhD thesis to Ashland and assisted me with timetable data on his employment. Bob Korfhage furnished photographs; F. Tom Ledig and Ron Lanner shared important ideas on gray pine; Tom Fealy provided his research papers; and from Kew Botanical Gardens: Lynn Parker provided the image of Joseph Sabine, Joanna Osborne, the image of the type specimen, and Roxanna Ferillini, a copy of her Master's thesis.

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Dangly Fen Sedge (*Carex limosa* L.)

Bruce Newhouse  
2525 Potter St., Eugene, OR 97405



Dangly fen sedge at Bunchgrass Meadow, Washington. Photo by Bruce Newhouse.

“The cutest *Carex* in Oregon” is *Carex limosa*, according to many botanists. In the recent *Field Guide to Sedges of the Pacific Northwest*, the authors noted that “mud sedge is too mundane a name for this graceful little fen dweller” (Wilson *et al.* 2008). Not only does it grow primarily in “non-muddy” wetlands, it also has much more aesthetic appeal than “mud.” I suggest a common name that reflects both its appearance and its habitat (see sidebar): dangly fen sedge. Of course, some readers will smile at the combination of “dangly fen,” but when they encounter living plants, they will see that the spikelets of this sedge dangle from long slender stems and shake gently in the breeze. This trait is not obvious in herbarium specimens and drawings or photos of pressed plants, which often give a false impression that spikelets are erect or stationary.

Range and Rarity

Dangly fen sedge has a circumpolar distribution in the northern hemisphere, occurring in northern Europe, all of Canada and approximately the northern half of the US, extending south into the mountains of California and New Mexico. In Oregon, *Carex limosa* grows along the spine of the Cascade Mountains from Multnomah County south to Jackson and Klamath counties, plus two sites in the mountains of northeastern Oregon (Elkhorn and Wallowa mountains). Eighteen voucher specimens have been collected from about ten sites in Oregon, with another 16 observed locations (occasionally photographed). Most of the collections are in the OSU herbarium, except for a few in agency and community college herbaria. The herbarium at the University of Washington



An 1877 Dutch illustration shows the stolons and other features of dangly fen sedge. Illustration from [http://caliban.mpiz-koeln.mpg.de/~stueber/batava/band17/high/IMG\\_9539.html](http://caliban.mpiz-koeln.mpg.de/~stueber/batava/band17/high/IMG_9539.html)

(WTU) houses 22 specimens from ten Washington counties. Most were collected from the Cascade Range, but a few are from mountainous northeastern Washington.

The University of California's Jepson Interchange website (Jepson Online Interchange 2008) indicates that *Carex limosa* has been found in California primarily in the high Sierra Nevada Mountain region, with two sites in the North Central region, for a total of 46 vouchers in 8 counties. It is rated S3 for rarity in California, indicating an extent of "21-80 occurrences or 3,000-10,000 individuals or 10,000-50,000 acres" (CNPS 2009). Because it occurs fairly regularly throughout its worldwide, boreal range, the global status of dangly fen sedge is secure, and in North America, it is rare only at the southern limits of its range (NatureServe 2009). Dangly fen sedge is not a rare species in Oregon and Washington.

### **Carex limosa locations in Oregon**

(specimens at OSC and observation locations, summarized from Oregon Flora Project 2009)

#### **Clackamas County**

Near Government Camp (1916, OSC)  
Dinger Lake, Mt. Hood NF (1993 obs.)

#### **Deschutes County**

Southern mire of three main mires at Little Cultus Lake (1985, 1993 OSC)

#### **Jackson County**

Swamp (1902 OSC)

#### **Klamath County**

Swamps along west boundary, Crater Lake National Park (1928 OSC)

28 mi. NW of Klamath Falls (1979 OSC)

Tunnel Creek Wetland (2001 obs.)

#### **Lane County**

Gold Lake Bog (1926, 1977 OSC; 1989 obs.)

Quaking Aspen Bog, Quaking Aspen Swamp (1979, 1984 OSC; 1999 obs.)

Hidden and Lulu Lakes (1992 obs.)

Cedar Swamp and meadows to north and west (2005 obs.)

Skookum Creek Swamp (2001 obs.)

Meadows at headwaters of French Pete Creek (2005 obs.)

Meadow southwest of Blue Lake (2005 obs.)

Shroy Meadow, Mink Lake Basin: Shroy, West Porky and Cliff Lake meadows, Cow Swamp (2006 obs.)

#### **Linn County**

Bog 100 yards south of Jct. of Hwy 22 and USFS Rd. 2067 (1996 OSC)

Hwy 22 & USFS Rd. 2067 (1996 obs.)

Meadow on east side of Jack Creek, south of Marion Lake (2005 obs.)

#### **Multnomah County**

Vicinity of LaTourelle Prairie (1996 obs.)

#### **Union County**

Headwaters of the Grand Ronde River (2001 OSC)

#### **Wallowa County**

Bog at Duck Lake (1991, 1999 OSC)

#### **Wasco County**

Trapper Meadow (1995 obs.)

### **Relatives and Look-alikes**

Dangly fen sedge belongs to a small section of the genus *Carex* (Section Limosae) whose members often have yellow felt-like hairs on young roots (Hitchcock and Cronquist 1973, Mastroguiseppe



The range map from the PLANTS web site shows the primarily boreal distribution of *Carex limosa* in North America.

## Limos and Common Names

The Latin word *limos* in the specific epithet means “slimy” or “muddy.” Linnaeus, who named *Carex limosa* in 1753 in *Species Plantarum*, was probably referring to wet habitats in northern Europe where this species was first described. In the western US, its habitats are peaty fens and bogs (sometimes floating bogs), rather than “slimy, muddy” places. German web sites generally list the species as “schlamm segge” (mud sedge), and a Danish site lists “mudder rietgrass” and two English common names: “mud carex” and “green and gold carex.” In the Flora of North America, Ball and Reznicek (2002) include a French name, “carex des bourbiers,” which translates to “mire sedge<sup>1</sup>.” Peck (1961) and Janeway (1992) used the name “shore sedge;” both “mud” and “shore” are common names listed by Hurd *et al.* (1998) and the Washington Flora Checklist (Burke Museum 2009). Hipp and others (2008) call it “muck sedge” in the *Field Guide to Wisconsin Sedges*. In the UK, *Carex limosa* is known as “bog sedge” or “common bog sedge.” The common name dangly fen sedge is my invention; it has not been published anywhere else.

## More About Limosa

Linnaeus also used “*Limosa*” to designate the genus of godwits, a group of tall, lanky shorebirds with very long bills. These bills, slightly upturned at the end, are an adaptation for probing in mud to feed on subsurface invertebrates. One Eurasian species, the Black-tailed Godwit, is named *Limosa limosa*<sup>2</sup>. (Perhaps a direct translation would be the “slimy-slimy?”)



Black-tailed godwit (*Limosa limosa*). Photo by Marek Szczepanek.

1 Bourbiers can also be translated as bog, slough, quagmire, morass or plight.

2 Tautonyms (in which the specific epithet is the same as the generic name) may be applied to animals, but are not allowed in botanical nomenclature.

1993), and whose flower spikes, borne on long peduncles, often dangle. All modern references consulted for this article consider *Carex limosa* L. as one taxonomic entity, with no subspecies or varieties currently recognized. At the terminus of the *Carex limosa* inflorescence is an all-male spikelet, skinny and nondescript. The lower spikelets (usually two to four) are female, sometimes with male flowers at the tips. These lower spikelets dangle on long peduncles at maturity.

Within Section Limosae, dangly fen sedge's two closest relatives in Oregon are long-awn sedge (*Carex macrochaeta*) and black bog sedge (*C. pluriflora*). Both are considered rare and are restricted to the northwestern part of the state. The *Field Guide to Sedges of the Pacific Northwest* tells how to distinguish these three species in Oregon, including morphological characters, as well as range and habitat differences. Long-awn sedge grows primarily on moist cliffs in the vicinity of the Columbia Gorge, while black bog sedge, with its distinctive black perigynia, is currently known from only one wetland near Seaside. In the Pacific Northwest, the species that most closely resembles dangly fen sedge is black bog sedge (*Carex magellanica* ssp. *irrigua*). It is a Rocky Mountain species that occurs as far west as northern Washington and it is highly unlikely that this species would be found in Oregon. Dangly fen sedge and black bog sedge have been known to hybridize where their ranges overlap (Gage and Cooper 2006).

Dangly fen sedge also superficially resembles two “dangly” grasses, big quaking grass (*Briza maxima*) and rattlesnake brome (*Bromus brizaeformis*), but luckily for the beginning botanist, grasses differ greatly in their reproductive structure. Additionally, these two grasses grow in human-disturbed habitats at low elevations, not montane wetlands.

If you find a sedge in the Cascade or Willowa mountains of northern Oregon that you think is dangly fen sedge, use a key that includes look-alike species with overlapping ranges (e.g., *Field Guide to the Sedges of the Pacific Northwest*). If it is a “new” location (a site not shown on the distribution map), the population contains more than 20 individuals, and you have the landowner's permission, collect a specimen for the OSU herbarium (and possibly another for a second, nearby herbarium). Such collections allow taxonomists now and in the future to closely examine material for an accurate assessment. Otherwise, take photographs and document the location.

## Biology and Ecology

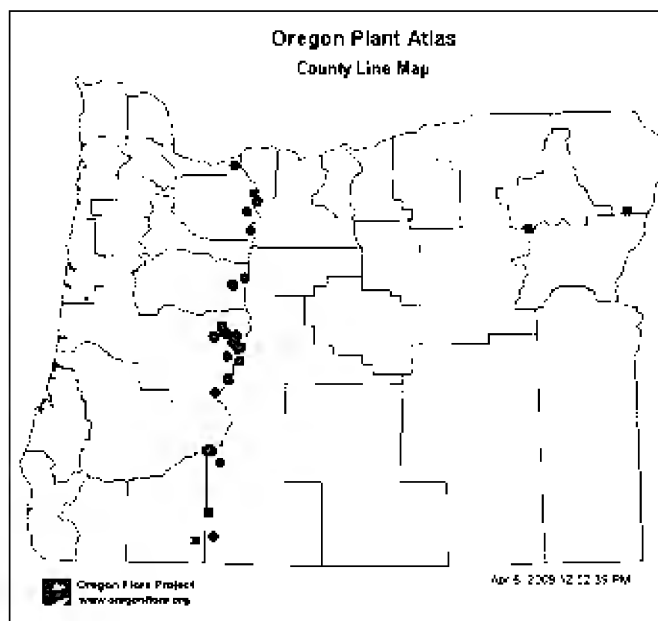
Dangly fen sedge is stoloniferous (unusual in the genus *Carex*), but is sometimes described as having rhizomes (lateral below-ground stems) because the stolons (lateral above-ground stems) may be shallowly embedded in the very wet substrate in which it grows. Slender tufts of stems and thin leaves with incurved margins usually are spaced widely apart along the stolons. Montane wetlands tend to be nutrient-poor, setting the stage for intense competition among plants in the communities. Along the stolons, dangly fen sedge has occasional “sinker” roots that penetrate deep into the substrate and enable it to take up the nutrients more efficiently than many of its taller competitors (Wilson *et al.* 2008). The fine tufts of delicate leaves and a tendency to mix with other vegetation make dangly fen sedge difficult to spot. Once, Washington caricologist (sedge expert) Fred Weinman overlooked this species the first time

he visited a particular site, and found it only by returning to search for it a second time!

Dangly fen sedge is a species of mountain wetlands. Collection sites in Oregon range from 3,000 to 5,500 feet, and in California up to about 6,600 feet in the Sierra Nevada Mountains. Collectors of dangly fen sedge in Oregon, Washington, and California described its habitat as sunny, wet sites, using a variety of terms: bog, mire, swamp, wet peaty sedge meadow, sphagnum bog, soggy *Darlingtonia* meadow. I have seen the species in about ten locations in the central Cascades of Oregon, where it grows with peat mosses and with other wet-site sedges and forbs. Occasionally, I found it in more open, muddy habitats. I learned to approach it cautiously in floating mat habitats after punching a foot (or more!) through to cold lake water. In the Rocky Mountains, dangly fen sedge occurs also primarily in fens, and in a wide range of pH and nutrient conditions (Gage and Cooper 2006).

### Associated species in Oregon

Dangly fen sedge often mingles with other sedges, including water sedge (*Carex aquatilis*), silvery sedge (*C. canescens*), star sedge (*C. echinata*) and southern beaked sedge (*C. utriculata*), and with a number of montane wetland plants, e.g., peat mosses (*Sphagnum* spp.), spikerushes (*Eleocharis* spp.), cottongrasses (*Eriophorum* spp.), marsh or purple cinquefoil (*Comarum palustre*) and English or



Distribution of *Carex limosa* in Oregon. Map courtesy of Oregon Atlas Project, [www.oregonflora.org/atlas.php](http://www.oregonflora.org/atlas.php)

line-leaved sundew (*Drosera anglica*). Other common associates are Baltic rush (*Juncus balticus*), marsh buckbean (*Menyanthes trifoliata*), podgrass or American scheuchzeria (*Scheuchzeria palustris*), willows (*Salix* spp.), alders (*Alnus* spp.), alpine shooting star (*Dodecatheon alpinum*), Gorman's buttercup (*Ranunculus gormanii*), elephant's head pedicularis (*Pedicularis groenlandica*), and lodge-pole pine (*Pinus contorta* var. *latifolia*) is often nearby. A collection label from Gold Lake Bog (Lane County) listed a moss (*Drepanocladus vernicosus*).

In Oregon, other species that share dangly fen sedge's montane wetland habitats are Roosevelt elk, black bear, sandhill crane, a small damselfly called sedge sprite (*Nehalennia irene*), and a small butterfly called dun skipper (*Euphyes vestris*). The skipper lays its eggs on sedges, where its larvae feed.

### Conservation

Because dangly fen sedge grows in wetlands on public land above 3,000 ft. in Oregon, land management practices generally do not jeopardize populations here. Potential exceptions include grazing, long-term plant succession and climate change. Large ungulates graze sedges and other graminoids, and elk occasionally create wallows in wet areas. (Over-hunting of mountain lions, the primary natural predator of elk, could result in larger populations and potentially affect vegetation



If you look very closely, you might find dangly fen sedge in this type of habitat, Blue Lake, Lane County, Oregon. Photo by Bruce Newhouse.





An elusive sandhill crane left tracks in the mud between sedges at Cow Swamp in Lane County. Photo by Bruce Newhouse.

similar to documented trophic cascade effects in other ecosystems; e.g., Ripple and Beschta 2003.) Fortunately, some populations of dangly fen sedge in Oregon grow on floating *Sphagnum* mats, which presently are too wet for ungulate use. In long-term succession, fens and bogs tend to fill in with soil and denser, woody vegetation, making habitat less favorable for dangly fen sedge and other herbaceous plants. With climate change, one could speculate that higher temperatures and changes in precipitation could eventually alter the range of the species. But for now, too many unknowns limit meaningful prediction.

### Final thoughts

The best time to look for dangly fen sedge in montane Oregon depends somewhat on weather, particularly, how much snow has fallen during the previous winter and how long it lingers at higher elevations. In general, from early July (mid-elevations) through mid-September (high elevations) is the best time to find mature plants. Like nearly all sedges, it is more easily identified when its fruits (perigynia) are fully mature.

Dangly fen sedge is a delicate little plant that will reward you – if you are lucky enough to find it – with its subtle beauty during your light-footed treks through montane wetlands. While you are botanically fascinated by a fen, perhaps a sandhill crane will startle you as it takes off from behind a willow copse across the way, and as your heart slows to normal, you may notice something down at your feet. Voilà! As you smile and drop gently onto your knees, there it will be with its dangling spikelets dancing a bit in the breeze.

### Acknowledgements

Eminent botanist Peter Zika fostered my initial attraction to graminoids. Peter showed me how interesting it could be look close and study the tremendous plant diversity in the smallest plants around and under my feet. Over the ensuing years, the *Carex* Working Group (Dick Brainerd, Nick Otting and Barbara Wilson) furthered that appreciation. I now find sedges to be “familiar old friends” when I travel in the Northwest and beyond (despite my trouble with that challenging Section, Ovals). I extend special thanks to Thea Cook of the Oregon Flora Project (Atlas), Barbara Wilson for initial editing, and Dana Visalli, Nick Otting, Fred Weinman, Barbara Wilson and Peter Zika, for responding to my request for information.

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Dangly fen sedge occasionally grows in patches, as seen here at Swamp Lake, Washington. Photo by Bruce Newhouse.

## Wetlands: Bogs, Fens and Poor Fens<sup>1</sup>

Although fen, poor fen and bog have been defined in many different ways throughout the world, the terms here follow definitions in the recent US Environmental Protection Agency publication EPA 843-F-01-002b, Types of Wetlands, March 2002, available on line at [http://www.epa.gov/owow/wetlands/facts/types\\_pr.pdf](http://www.epa.gov/owow/wetlands/facts/types_pr.pdf). Whether the water, soil or substrate is acidic or alkaline greatly influences which plant species thrive in a given wetland. A fen is a wetland in which the water is alkaline to only slightly acid and has been in contact with mineral soil; the substrate is accumulated organic material derived primarily from graminoids (grasses, sedges, rushes) and bryophytes other than sphagnum. Fens may be flat or sloping, including relatively steep slopes. A bog is a wetland in which the water is acidic and comes only from precipitation, which is relatively mineral-poor compared to groundwater; the substrate is accumulated organic material derived primarily from sphagnum, graminoids, and ericaceous shrubs. Bogs may be flat or sloping and are characterized by a sphagnum peat layer that lifts the vegetation above contact with mineral-rich ground water. In Oregon, there are apparently no true bogs, and the acidic wetlands with sphagnum are classified as poor fens. The modifier comes from the relatively poor nutrient levels and acidic conditions. Peat refers to the amorphous or partially decomposed organic remains of plant materials found in a bog, fen, or other wetland. Peat found in bogs derives from sphagnum, so it is acidic and has special characteristics related to the antiseptic properties of the moss. It is often used as an additive to make garden soils more acidic and increase organic content. Peat formed from graminoid organic matter may not be acidic. —Frank Lang and John Christy

<sup>1</sup> Adapted from sidebar in *Kalmiopsis* 11:31.

## About Sedges

*Carex* is the largest genus in its family, Cyperaceae, and one of the largest plant genera in the world. In a field guide to Oregon and Washington sedges, Wilson *et al.* (2008) noted that Linnaeus used the classic Latin name, *Carex*, for the genus; the Latin word means “cutter,” in reference to knife-like leaf edges. Another recent, in-depth treatment of the genus can be found in the Cyperaceae section of the Flora of North America (Ball and Reznicek 2002).

Sedges are wind-pollinated monocots that produce achenes. In *Carex*, the achene is contained within a membranous bract (perigynium) that is open only at the tip. The mature perigynia fall, or are easily knocked loose from their spikelets and disseminated by water, wind or wildlife (especially waterfowl). Birds flying between wetlands probably transfer achenes among remote montane habitats, so that sedge populations do not remain genetically isolated.

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## The Pokegama Plateau

Connie Battaile  
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Overview of the Pokegama Plateau from Hobart Bluff, looking east. Parker Mountain lifts out of the center of the Plateau to 5,210 ft. to meet the skyline. On the left skyline beyond it, Surveyor Mountain rises on the northeast side of the Plateau to 6,400 ft. as the Cascades climb to the old caldera of the Mountain Lakes Wilderness. To the right of Parker Mountain, Chase and Hamaker mountains east of the Klamath Canyon also rise to over 6,000 ft. then drop to the Klamath Basin south of Klamath Falls. Photo by Charles Raper.

Between Ashland and Klamath Falls, travelers speed along Route 66 as they traverse a comparatively flat, heavily logged region in the Cascades. Most don't even know its name, and few give it any notice. And no wonder, the Pokegama (Po KEG a ma) Plateau is both aesthetically and botanically unappealing.

My husband Julian (1925-2005) and I felt a bit that way, too, after he "adopted a block" for the Oregon Flora Project (OFP) in 2000. His assignment was to search the designated area (24 by 26 miles) in southwestern Klamath County and to report what was growing in that botanically little reported area so that it could be better represented in the Oregon Flora Project. Well, what fun! He and I, non-botanists both, set forth with clippers and bins, got books and a dissecting microscope. Through many hours of collecting and many more hours of keying, our knowledge grew, and each year we turned in a plant list to the OFP. After several years it dawned on us that we were collecting as if the area were a doughnut, focusing only on the perimeter, especially the high country on the north end of our block which included Lake of the Woods and the Mountain Lakes Wilderness, and on the south end which dropped down into the formidable Klamath Canyon. The center contained tens of thousands of heavily logged acres that gave us little incentive to botanize.

But then, troubling questions began to nag us. The area looked as if every square foot has been logged and scraped – why? Why has there been *so much* logging? Does state law really allow that much logging? Who owned all of that cutover land? How did so much timberland get into private ownership? What was it like when the first Europeans arrived? To find the answers, we went back in time and discovered a tangled history of graft and greed.

### Overview of the Plateau

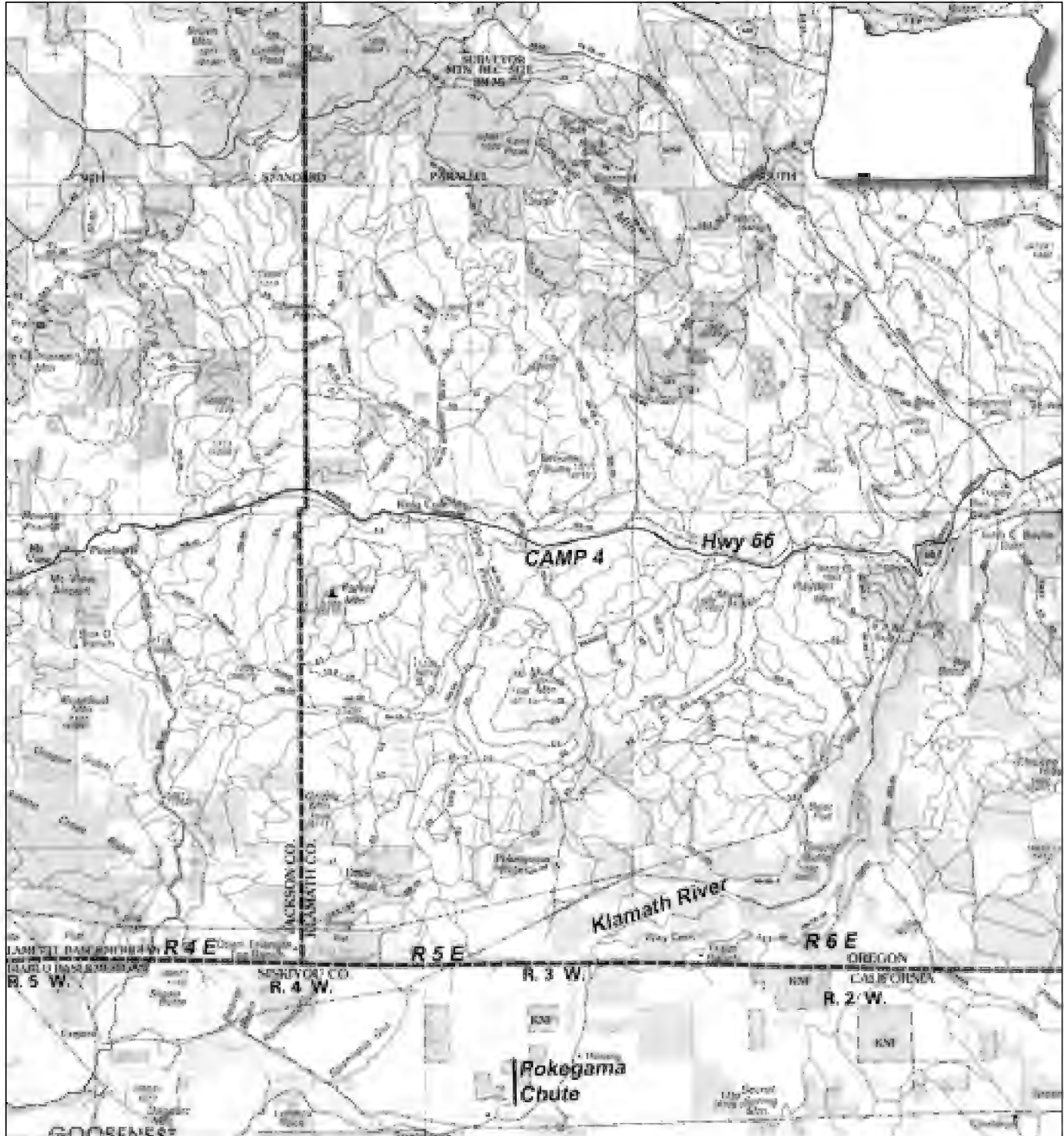
State Highway 66, also known as the Greensprings Highway, crosses the Pokegama Plateau (an area of about 140,000 acres) for about 20 miles between Pinehurst Inn at Jenny Creek and the Klamath River crossing at Boyle Reservoir. The Plateau, which averages about 4,200 feet in elevation, drains to the Klamath River, which tumbles swiftly west through a canyon along the south edge. Winters are cold, but summer days can be hot. Mean annual temperature on the Plateau is 40 to 43 degrees Fahrenheit, which is 10 degrees cooler than in Ashland (2,000 feet lower). The growing season is short, with fewer than 100 days between frosts. Precipitation averages between 25 and 35 inches, falling mostly between October and March, some as snow (SCS 1993). The annual average is near the lower limit for supporting forest growth, which is further limited by lack of rainfall during the growing season. Geologically, the Plateau is part of the Cascade Range, which means that it is volcanic in origin. Soils of the Pokegama Plateau formed from weathered volcanic substrate, so are reasonably fertile. Although usually fairly deep, they are often rocky. The 100-year site index for Pokegama-Woodcock soils (the predominant soil series) is 120 feet (tall) for Douglas fir (*Pseudotsuga menziesii*) and 105 feet for ponderosa pine (*Pinus ponderosa*), which makes it a Class IV site, near the slow-growing end of the scale of I to V. Early lumbermen prized the excellent old-growth lumber for its close annual growth rings, 8 to 10 per inch. Now, trees in managed plantations on the Plateau grow to 14 inches dbh (diameter at breast height, 4.5 feet above the ground on the uphill side) in about 50 to 60 years with about 5 annual rings/inch. Because mills now take logs down to 11 inches, the interval between harvests may be less than 50 years (Chris Sokol, Forester,

pers. comm.). Clearly, other management strategies could occur with changes in ownership, but economic pressures on private land usually favor short-term returns.

### A Natural Corridor

Because the Klamath is the first river south of the Columbia River to cut through the Cascade Range, its path through the Cascades

has long been of interest to those wanting to cross these mountains. Although the canyon bottom itself is close to impassable, the “Klamath corridor,” which includes the Pokegama Plateau, has been used as a travel route since humans first appeared in the area. Peter Skene Ogden in 1827 was the first known historic figure to cross, followed by the Applegate Trail in 1846, the Southern Oregon Wagon Road in 1869, and, in the late 1870s, the telegraph line between Fort Klamath and Jacksonville. The grading and graveling of



The Pokegama Plateau is a rough circle around Camp 4. Highway 66 bisects the Plateau; Ashland lies 20 miles west and Klamath Falls 20 miles east of the left and right sides of the map, respectively. The Klamath River flows south and west from the middle right. Private ownership is shown as white; the dark gray shaded areas to the north are National Forest land, and the lighter gray areas to the south are managed by the BLM. The map is a portion of the Oregon Department of Forestry map of the Klamath-Lake Forest Protection District.

present-day Highway 66 was completed in 1922 and, more recently, gas and power lines have crossed through the corridor.

Plants and animals (as well as butterflies) have also moved across the Plateau as well as through the river canyon itself. Curlleaf mountain mahogany (*Cercocarpus ledifolius*), aspen (*Populus tremuloides*), and sagebrush (*Artemisia tridentata*) are among the “east side” plant species that have adapted to conditions west of the southern Cascades, while birchleaf mountain mahogany (*Cercocarpus betuloides*) is one that migrated from west to east.

### Historic Vegetation

Archeologists report that before European contact, the Native Americans in the region (Shastas to the west and Klamaths to the east) who wintered in the river canyon and in the valleys on the west and east sides of the Cascades, came to the Plateau to hunt, and, in the spring, to dig roots, especially *Periderida* (yampah). Later in the season, they gathered berries and seeds (including sugar pine) and found resources on the Plateau for their housing, clothing, tools, and medicines (Beckham 2006).

In 1827 Peter Skene Ogden provided the earliest written description of the vegetation as he guided his Hudson’s Bay Company fur-trapping brigade west across the Cascades from the Klamath Basin. Skirting the dangerous Klamath Canyon, the party crossed what we now call the Pokegama Plateau, and then dropped down to the Klamath River at a site that now lies under Copco Lake. Near the beginning of their traverse across the Plateau on the 25<sup>th</sup> of January, Ogden’s journal reads: “the Trappers made several attempts to reach the river but could not. I also made an effort but in vain. For upwards of ten miles perpendicular cut rocks not less than five hundred feet in height...In our travels this days I saw the White Pine of a very large size Ceedor [*sic*] also, some Wild Plane Trees...” (LaLande 1987). His white pine would have been sugar pine (*Pinus lambertiana*), the “Ceedor” was incense cedar (*Calocedrus decurrens*), but the wild plane trees (leafless, of course, in January) are perplexing. Perhaps they were quaking aspen, because their smooth bark might appear similar in winter (F. Callahan, pers. comm.).

The next Europeans in the area arrived in 1846, when a party of early settlers from the Willamette Valley, looking for a better wagon route into Oregon, explored the Plateau from west to east and located what became the Applegate Trail. These explorers commented several times about large trees that they encountered as they crossed the Plateau, as did 1846 emigrant A. E. Garrison, who wrote, “... the Siskiyou [Cascade] Mountains which was heavily timbered and a great job it was to cut a road across...” (Helfrich 1996 Part 1, p. 86). Jesse Quinn Thornton, another 1846 emigrant, recounted that after crossing the Klamath River at Keno, “We had entered the dense forest of fir-trees and pines, which covered the mountains with their thick and dark green foliage, soon after leaving the river. In the distance we had seen, as we imagined, precipices, which in some places were perpendicular, while in others they appeared to exhibit overhanging rocks of stupendous grandeur... The forest upon this side of the rude and rugged mountain, was very dense and lofty, and gave it a gold, wild, solemn, and irregular appearance. In most places the huge trees were interwoven; but in some places there seemed to be large breaks or openings” (Beckham 2006).

The “General Description” notes of the first land surveyors also comment on the extent and quality of the timber in the area, as in the description following the 1874 survey of T40S, R5E: “The Land in this township is quite level for a mountainous country. The Soil is 2<sup>nd</sup> and 3<sup>rd</sup> rate. The timber for which this township is especially valuable is first rate sugar pine, yellow pine, fir and cedar. Almost every one of which is easy of access...” In a 1900 US Geological Survey report, John Leiberg commented on the timber species and quantity and the effect of fire in each township on the Plateau. For example, about T40S R5E, he wrote, “It bears a forest of noble proportions, ideally suited for lumbering operations. The most valuable components of the forest here are yellow and sugar pine. The growth of these two species is symmetrical and large, the sugar pine reaching basal diameters of 9 feet, and the yellow pine of 5 to 6 feet, with clear trunks 30 to 65 feet in length. Fires have run through this stand of timber very many times, and there are not many trees not fire seared. The greatest damage has been done to the firs, both red and white, which therefore are largely defective and are not much cut for lumber. The young growth has also been destroyed, and reproduction is therefore defective.” (Beckham 2006).

An early lumberman wrote that “In this district, nearly all of the mature pine trees range from 250 to 400 years old and from twenty-four to forty-eight inches in diameter.” The largest sugar pine Weyerhaeuser cut on the Plateau measured 6’ 9” in diameter (Drew 1979). No trees older than 400 years have been reported, nor any 10-foot diameter giants like those that occur farther north in the Cascades and in the Coast Range. This may be because the growing conditions are so harsh that trees don’t live more than 400 years, or perhaps the pine beetles, which have so troubled foresters there in the past 100 years, also took their toll earlier. Alternatively, or perhaps additionally, a study of the fire history of the Cascades reported that the 1500s were a time of extensive fires, so perhaps fire or drought at that time explains why there were no trees older than 400 years (Duncan 2002).

In addition to the mixed conifer forest of ponderosa pine, sugar pine, Douglas fir, incense cedar, and white fir (*Abies concolor*), the first travelers would have encountered a number of shrub species, including chinquapin (*Chrysolepis chrysophylla*), serviceberry (*Amelanchier alnifolia*), Scouler’s willow (*Salix scouleri*), green leaf manzanita (*Arctostaphylos patula*), antelope bitterbrush (*Purshia tridentata*), snowbrush (*Ceanothus velutinus*), and scattered whitethorn (*Ceanothus cordulatus*).

### Land Ownership

Because many 19<sup>th</sup> century federal land grants, such as the Homestead Act, were designed to encourage agricultural settlement, much of the heavily forested land (unsuitable for agriculture) remained in federal ownership in the West. Yet, on the BLM map that covers the Pokegama Plateau, Highway 66 is shown crossing less than a mile of public land between Pinehurst Inn and Klamath Falls, and the private land extends for miles both north and south of the highway. How did such a large tract of timberland end up in private ownership when this area could never have been described as having much agricultural potential?

The story begins in 1848 when Oregon became a US Territory, and title to all land, except for any Indian claims that hadn’t yet





Whitethorn (*Ceanothus cordulatus*), noted for its rigid, spine-tipped twigs, grows in scattered locations on the Pokegama Plateau. Elsewhere, this shrub grows in such dauntingly impenetrable thickets that in 1908 the North Umpqua district ranger dubbed a ridge “Dread and Terror,” as he contemplated the prospects of fighting a fire in the whitethorn scrub. Photo by Connie Battaile.

been resolved, was vested in the US government. However, during the next hundred years, the federal government transferred title to nearly half of its Oregon lands to private ownership or to the new state of Oregon.

Most of the portion granted to the State came through the 1848 “Organic Act” that established the Oregon Territory. That Act granted ownership of sections 16 and 36 of every township (over 5% of the total land area) to the State for the support of education. Of that original 3.5 million acre land grant, less than 20% now remains in state ownership and much of that is sagebrush steppe in eastern Oregon. Most of the rest of those school lands were sold for \$1.25/acre in the 1880s and 1890s in land scams. The proceeds from the sale of those lands went into the “Common School Fund” and continue to provide a minor portion of the state’s support of public education.

The law governing the disposition of the “school lands” required the purchaser to sign that he was purchasing the land for his own benefit and not for speculation, and that he had made no contract for the sale or disposition of that land. He then was allowed to purchase 320 acres (1/2 section). Stephen Puter, in jail for land fraud, describes in his 1908 book, *Looters of the Public Domain*, the way he and others bilked the state out of school lands in the northern part of the state, abetted in most cases by the graft of public officials. The process in Jackson County appears to have been similar. In looking through some of the deed records for the Jackson County area of the Plateau, I found that in 1889 and 1890, one James Abraham bought 26 parcels of land from assorted individuals, each parcel being half of a section 16 or 36, and curiously (and in violation of the law), each parcel had been bought that same day from the state.

As noted earlier, in addition to the transfer of federal lands to the state for school purposes, Congress authorized the federal government to transfer land to private parties to encourage agricultural settlement, in Oregon most importantly through the Oregon Donation Land Act of 1850 and the Homestead Act of 1862, both of which required residency on the land for several years. However, the Timber and Stone Act of 1878 allowed for the cash purchase of 160 acres of non-arable federal land for \$2.50/acre so that ranchers would have timber and stone for their building needs.

Congress also used land grants to further the development of railroads and roads. In the 1860s Congress granted the Oregon and California Railroad (O&C) every odd-numbered section of land for 20 miles on either side of their proposed rail line through Oregon from Portland to the California border, or if those sections were already claimed they could claim from a wider strip. In the 1870s *The Oregonian* editorialized, “It is not right to humbug people abroad with the idea that these O&C railway lands are valuable. They are simply ordinary mountain lands, covered for the most part with immense forests of fir trees situated where timber is no object, expensive to open for agriculture, and only second or third rate when open.” Congress took back the O&C lands 50 years later; but not before Southern Pacific (the successor to the O&C Railroad) had already sold, among other sales, 20,000 acres of O&C timberland on the south end of the Plateau to a Michigan timber company. (More on this company below.) Congress also authorized various land grants to support the building of several “military” roads, most of which were land scams from the beginning.

By the 1880s, the vast pine forests of the upper Midwest were nearly logged out, and entrepreneurs were eyeing the potential value of Western timberlands. Land fraud, much of it designed to secure ownership of timberland, ran rampant in Oregon for 20 years until Oswald West, as state land agent from 1903 to 1907 cleaned up the corruption (he was later governor). Jack Bowden wrote of the scams, “In Oregon alone, over 3,700,000 acres of forest land transferred from public to private ownership as a result of these practices, more than in any other state. The abuses became so blatant that in 1903 President Theodore Roosevelt withdrew public forest lands from entry under the Timber and Stone Act, but not before a number of people in high places had been caught with their hands in the cookie jar. Those convicted of various crimes and misdemeanors included a US senator, a State senator, the Oregon Surveyor General, Deputy Surveyor, a State congressman, and the head of a large Oregon lumber firm, along with a significant number of lesser figures. All were from Klamath, Lake, Crook, Douglas, Linn and Multnomah counties.” He also noted that the infamous “Wisconsin Case” included choice timberland along Jenny Creek, and that in 1906, Sumner Parker of Ashland was among those indicted for land fraud with homestead lands (Bowden 2002 p. 9).

It is not clear that how much fraud there was on the Pokegama Plateau beyond that involved in Abraham’s purchase of school lands, although abuse of the Timber and Stone Act seems likely when, for example, on June 29, 1891, 23 men filed claims for 160 acres each in the middle of the Plateau (Beckham 2006).

Weyerhaeuser Company quietly began buying up land on the Pokegama Plateau in 1904, and by the end of the next year the company owned 158,000 acres. So far as I’ve been able to find, that land had already passed into private ownership without any connivance by Weyerhaeuser. The school lands, for example, had passed into private ownership fifteen years earlier.

### The Logging Begins

By 1905 Weyerhaeuser owned most of the Pokegama Plateau plus twice as much land east of Klamath Falls, but they did nothing with their Klamath area holdings for 25 years. This was partly because of a 40-year glut of lumber in the US that lasted until after World



A log hits the Klamath River with a giant splash after its run down the Pokegama chute about 1900. The scar from the chute is still visible on the hillside today. Maud Baldwin photo courtesy of Klamath County Museum.

War II and partly because Weyerhaeuser Company would not build a sawmill until the area was served by two rail lines.

Before Weyerhaeuser acquired their land, there had been some earlier logging, primarily on the southwest portions of the Plateau. As noted earlier, by the 1890s a Michigan company had bought over 20,000 acres of timberland (over 34 square miles of O&C land) from Southern Pacific Company. This Michigan timber company, by then called the Klamath River Lumber & Improvement Company, built a community on the south bank of the Klamath River, three miles southeast of Hornbrook near the Southern Pacific rail line. The community, which eventually became known as Klamathon, included a large sawmill, two box plants, businesses, and housing for the workers.

The box plants milled pine, especially sugar pine, into "shook," the components for making boxes. The shook was shipped to the California orange groves and to other fruit growers where the boxes were assembled as needed. From today's perspective, it seems wasteful that most old growth sugar pine was logged to make fruit boxes.

Later, the Klamath River Land & Improvement Company was leased to the Pokegama Sugar Pine Lumber Company. "Pokegama" is a Chippewa word meaning a bay or lake in or at the side of a river. The Chippewa were an

Indian tribe near Lake Superior, and there are various features in Minnesota named Pokegama. Although the lessee had previously lived in Pokegama Falls, Minnesota, the actual source of the name is conjectural, but it remains delightfully quirky that the name of this dry upland plateau originally meant a large bay on a river.

The Klamath River Land & Improvement Company had built its mill at Klamathon near the Southern Pacific rail line so they could ship out their wood products, but their timberlands lay over 20 miles distant, up on the Pokegama Plateau. The river provided an obvious route, so the company planned to float their logs down the Klamath River. There remained the problem of getting the logs from the Plateau down the 800-foot drop to the river, a problem solved when they built a steep, half-mile chute down the north face of the canyon. The chute required a large rock cut that was lined with boards and several feet of trestle. Each log

created a cloud of smoke as it roared down the greased chute at 90 mph, sometimes setting the chute on fire. At the bottom, the log created a huge splash as it hit the river. When the river was iced over in the winter, the logs sometimes skidded completely across, coming to rest on the opposite bank.

Finally, after 10 years of problems with sinking logs (sugar pine is heavy), low water, and fatalities as men unsnarled log jams in the river, the river run was replaced in 1903 by a 25-mile railroad from Klamathon up to New Pokegama on the Plateau. However, six



Peeled logs ready to be sent down the Pokegama log chute. Note that the ends are beveled to prevent the log end from splitting as it hit the water. Photo courtesy of Shaw Historical Library, Helfrich Collection No. 1648.



Camp #4 of the Weyerhaeuser Timber Company, about 1936. After an area had been logged out, the company moved the homes by rail to the next camp where they carefully placed them so that people had the same neighbors. Sometimes a house would be moved in the night with the family inside it, and at least once a school building was moved with the teacher and students inside. Photo by Bob J. Lewis, courtesy of Shaw Historical Library, Alfred Collier Collection.

months before the railroad was completed, a fire destroyed the mills and most of Klamathon, and the structures were never rebuilt. Currently, a marker near the Klamathon Bridge on the Klamath River is the only indicator of the former town.

After the mills at Klamathon burned, a several small sawmills were built on the Plateau with accompanying tent logging camps, one of them called New Pokegama. By 1911 those mills and communities were closed, and there was no more significant logging on the Pokegama Plateau for nearly 20 years until Weyerhaeuser began its operations.

### The Weyerhaeuser Years

In 1892, Captain Oliver Cromwell Applegate (son of pioneer Lindsay Applegate) went to the Republican National Convention intent upon spreading the word about the abundant timber resources of southern Oregon. One person he talked with was Frederick Weyerhaeuser, a midwestern lumberman who was interested in moving to the far west. In 1900 Weyerhaeuser incorporated the Weyerhaeuser Timber Company in the state of Washington, and as noted earlier, by 1905 the company was quietly buying up timberland in southern Oregon, including the assets of the Pokegama Sugar Pine Lumber Company and some other large tracts, as well as many small purchases from individuals. Eventually they owned 210,000 acres in their West Block and twice that in their East Block (Lake County), for a total of some 650,000 acres in southern Oregon (Hidy 1963).

Finally, in 1929, after a second railroad was built to Klamath Falls, Weyerhaeuser opened a mill there, the largest pine mill in the world with 23 acres under roof, and they employed 1,000 people in their southern Oregon operations. The company constructed a rail line west from its new Klamath Falls mill to its timberlands

on the Pokegama Plateau and during the next 30 years operated three successive logging camps along the rails: Camp 2 near Oatman Lake, Camp 3 north of Highway 66, and Camp 4 near milepost 32 on Highway 66. Unlike the “rag” or tent camps of Pokegama, the Weyerhaeuser camps had wooden buildings designed to fit onto rail cars so that they could be moved from camp to camp. Little trace exists of the camps now except for a couple of bushes of Siberian peashrub (*Caragana arborescens*) that survive in the disturbed, dry soil at old Camp 4. By 1956 most of the timber in the West Block had been harvested, and what remained was badly fragmented. The company determined that the remaining timber in their West Block could be brought out more economically by truck, and the rail line was torn out that year. Most of the railroad beds were converted to truck roads, and the remaining timber was trucked to

the mill. The main rail line to the mill was converted to a haul road, which meant that Weyerhaeuser’s trucks didn’t have to pay weight/mile tax and could carry heavier loads than on the public highways. That haul road, called the 00 Road, crosses Highway 66 on an overpass just east of Keno. Most of the focus of Weyerhaeuser’s operations and their logging camps then moved to their East Block, east of Klamath Falls (Bowden 2003).

Up until the late 1960s Weyerhaeuser had used selective cutting on its lands and had, it is reported, beautiful forests. But in the early 1970s the company converted to intensive management and realized a consequent 25% increase in production. They did this by clear-cutting the trees, piling and burning the slash, scraping the land, replanting, and fertilizing (though fertilizing was later determined not cost effective). They also put in a seed orchard and a nursery to supply genetically superior trees for planting. Incidentally, neither they nor subsequent landowners have replanted any sugar pine because mills find it difficult to process the heavy, wet sugar pine logs into lumber. The plantations are nearly all ponderosa pine except for a few pure stands of lodgepole pine (*Pinus contorta*), white fir, or Douglas fir. Neither Weyerhaeuser nor subsequent owners have planted any mixed stands. By 1979 trees being brought in to the mill averaged 14½” in diameter (Drew 1979).

In 1992 Weyerhaeuser closed its sawmill in Klamath Falls, and four years later, sold all of its southern Oregon forestlands to a company called US Timberlands, ending Weyerhaeuser’s 90-year presence in the region.

### US Timberlands/Inland Fiber

Because US Timberlands was a privately owned company little information is available except that John M. Rudey was Chairman, President and Chief Executive Officer (U.S. Timberlands 1999).

## Sugar Pine (*Pinus lambertiana*)

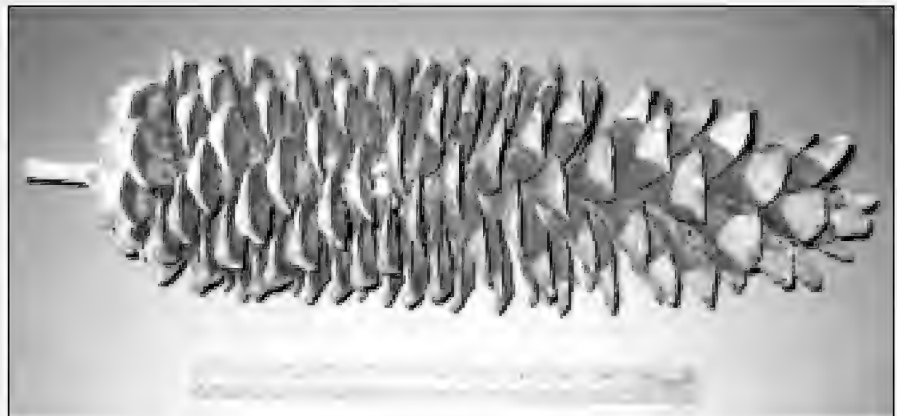
David Douglas discovered sugar pine in southern Oregon in 1826, and described the cones as looking like “sugar-loaves in a grocer’s shop,” dangling from branch tips high above the ground. He named it in honor of Aylmer Brouke Lambert (1761-1842), British botanist and author of the influential book, *Description of the Genus Pinus*. The common name refers to its sweet resinous sap, which John Muir is said to have preferred over that of maples (Schoenherr 1992). In Karok Indian territory along the lower Klamath River, sugar pine trees were individually owned (Schenck and Gofford 1952). In September, the owner would invite friends and relatives to a seed gathering party. He would make a long hooked Douglas fir pole and use it to pull himself up the tree. He then used a smaller hook to snag or shake the cones from the ends of the long branches. Native Americans roasted its large nutritious seeds, or ate them raw, powdered and pressed into cakes, or ground into “nut butter.” They used its pinitol-laden sap as a sweet treat and as a drug to treat stomach gas, loosen the bowels, and mixed with milk, as drops for sore eyes. Pinitol, a sugar alcohol, has insulin sensitizing and muscle building properties. Seeds were also used as beads in jewelry.

Early European settlers of the West soon discovered the virtues of sugar pine as a timber tree: enormous volume, and rot-resistant, light, straight-grained, knot-free, easily worked wood that has no taste or scent. Disgracefully, the abundance of giant sugar pine trees led to wasting the wood, including felling large trees end to end to make livestock corrals and fencing, or dropping a huge tree to make hand hewn shakes and shingles and leaving half of the tree to rot, all of this as trespass on government land (Peattie 1953). The huge, heavy logs required special techniques: logs had to be transported to mills using huge wheeled contraptions or the mill had to be brought to the tree. While wandering around in sugar pine country is not uncommon to encounter a huge stump with a pile of large decaying branches some distance away, evidence that a sugar pine was felled and milled on the spot (Arno and Hammerly 2007). The sawn lumber was hauled away, several boards at a time. Modern uses that take advantage of the wood’s virtues range from storage containers for fruits and pharmaceuticals to great wide knotless boards, making foundry patterns, and crafting piano and organ keys.

Sugar pine grows in dry to moist mixed conifer forests from 1,100 to 10,000 feet elevation, depending on latitude (lower elevations in the northern latitudes, higher in the southern). Its range extends from the northcentral Cascade Mountains south along the west slope of the Cascades through the Klamath and Sierra Nevada Mountains, and ending with an isolated

population in the mountains of Baja California Norte, Mexico. Large individuals usually grow scattered about the landscape, as part of a mixture of conifers; it almost never grows in pure stands. Sugar pine stores water like a cactus; when there is excess water, it hydrates itself and stores the water in its bole for later use<sup>1</sup>. During drought periods, when ponderosa slows its metabolism and Douglas fir sustains cellular damage from stress, sugar pine uses its stored water. However, on dry sites that lack excess water to store, sugar pine has no competitive advantage. Incidentally, this water storage makes sugar pine logs, especially the butt logs, exceptionally wet and heavy, accounting for the difficulties in transporting and milling (Tom Atzet, pers. comm.). Sadly, many trees are dying from the introduced white pine blister rust, or a combination of fire prevention and insect damage (native mountain pine beetles attack trees weakened by competition with smaller trees normally consumed by low to moderate intensity wildfires).

Under previous conditions, sugar pine grew to enormous size, as the largest species in the genus *Pinus*. The Oregon champion near Gateway State Wayside in Josephine County is 217 feet tall and almost 6.5 feet in diameter. The largest known sugar pine in the world, 209 feet tall with a circumference of 435 inches, grows near Dorrington, California (<http://www.americanforests.org/resources/bigtrees/register>). Trees may live to be 400 to 500 years old. Not only is sugar pine the tallest of the pines, its cones are the longest, sometimes attaining a length of over 20 inches. Sugar pine is truly one of the greatest conifers of western North America (if not the world) in stature, usefulness, and colorful history, and its decline is a tragic loss. —Frank Lang



Among the pines, sugar pine has the longest cones. Photo by Cindy Roché.

<sup>1</sup> Tom Atzet reported that when he first started working with sugar pine in southern Oregon, he automatically recorded sugar pine an age class older than the surrounding Douglas fir because the sugar pines were usually about 25% larger. (It was time-consuming to determine the age of sugar pine trees because “water” flowed out the end of the increment borer and he often had to wait five minutes for the flow of sticky sap to stop; then clean up the mess.) But after a few months of sampling he found that the sugar pine trees were the same age as, or sometimes younger than, the neighboring trees, particularly on deeper soils that had excess water in the spring.



A charred snag is one of the few reminders of the previous forest. The young trees are Douglas fir and ponderosa pine; the shrubs are snowbrush (*Ceanothus velutinus*) and willow (*Salix scouleri*). Photo by Connie Battaile.

The sale included some 600,000 acres of timberland, plus mills, seed orchard, and nursery for a total price of \$309 million. Rudey sold the Klamath Falls mill operations to Collins Pine Company. A year later US Timberlands made a public offering of shares in the company. The original offering was almost 7,500,000 shares at \$21/share for a total of over \$150 million. US Timberlands Company posted losses almost immediately, and in 2003 Rudey and his management group bought back the outstanding shares for \$3/share (Timberland 2003). The shareholders had lost (and management had gained) over \$130 million, and some of the unhappy shareholders sued, a suit as yet unresolved. The group of Rudey and others who had bought back the shares then organized themselves as The Inland Fiber Group. In 2006 they declared bankruptcy with \$225 million in notes due in 2007.

While in bankruptcy, Inland Fiber liquidated most of its timber assets, which is to say that just about every merchantable tree was removed. Under state law, a landowner has no obligation to leave any tree taller than 4 feet except for 10 feet tall along a scenic highway. Some taller trees have been left because they were not yet of a size to take to the mill, but for the most part, it will be years before there is again harvestable timber on that land.

Now, however, there is a new owner. In December 2006, newspapers reported that JWTR, a recently formed private company owned by Richard Wendt, had bought the 440,000-acre assets of

Inland Fiber for \$108,000,000. Wendt is founder of Jeld-Wen Inc., a large Klamath County business that makes windows and doors, with 20,000 employees around the world. He also created The Running Y Ranch, a destination resort northwest of Klamath Falls. Another related company, J-Spear Ranch Co., had previously bought two other large blocks of timberland in the area, so Richard Wendt is moving significantly into timberland ownership.

### Livestock Grazing

Logging has not been the only impact on the area. Weyerhaeuser began leasing out areas of its forestland for grazing in 1908 and by the end of that summer there were over 17,000 sheep on the Plateau. Today the sheep are gone but some 450 head of cattle still graze those lands. The cattle damage the meadows and riparian areas, competing

with a herd of elk that is growing in number. Surprisingly, a herd of wild horses also inhabits the Plateau. The Pokegama wild horse herd is thought to date to the early 1900s when a rancher turned loose a buckskin quarter horse stallion and some mares. Even though the herd is managed by the BLM, 80% of the land included in their horse management area is privately owned land (nearly all of it one-time Weyerhaeuser land). Under federal law, if the private landowner objected to the horses, the BLM would have to reduce the herd. The BLM management objective is to keep the



A typical Pokegama Plateau prairie in the spring. Several species of yampa (*Perideridia*) flower there in early summer, but by late summer the prairies have dried into cattle-trampled, sun-dried brick. Photo by Connie Battaile.





Ripe sugar pine cones dangle from the ends of branches in September. This tree and other individual sugar pine trees along Highway 66 are owned by the organization Friends of the Greensprings. Photo by Connie Battaile.

herd between 30 and 50 horses, so when the herd exceeded that limit, some horses were trapped and taken to the BLM wild horse facility at Burns for adoption by private owners.

### What is left on the Pokegama Plateau?

What does the Pokegama have to offer the Native Plant Society today? Is there anything left other than ponderosa pine plantations and a few sugar pines bordering the highway? Incidentally, the sugar pines are still there along the highway because the Friends of the Greensprings (FOG) organization sponsored a program to buy the individual trees from Weyerhaeuser, and FOG actually owns deeds to the trees (John Ward, pers. comm.).

Unfortunately, there are a number of invasive noxious weeds on the Plateau, including abundant Klamath weed (*Hypericum perforatum*), Dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*), dyer's woad (*Isatis tinctoria*), and leafy spurge (*Euphorbia esula*).

However, there are also a number of native plants. Of the over 600 species that Julian and I reported from his block, some 60 are found primarily on the Plateau and/or on the east side of the Cascades. A few of these are apus (*Perideridia erythrorhiza*), water plantain (*Damasonium californicum*), yellow owl's clover (*Orthocarpus luteus*), dagger pod (*Phoenicaulis cheiranthoides*), showy penstemon (*Penstemon speciosus*), Rydberg's penstemon (*Penstemon rydbergii*), pygmy monkey flower (*Mimulus pygmaeus*), white-stemmed blazing star (*Mentzelia albicaulis*), old man's whiskers (*Geum triflorum*), elk thistle (*Cirsium scariosum*), tansy-leaf evening primrose (*Camissonia tanacetifolia*), stemless suncup (*Camissonia subacaulis*), freckled milkvetch (*Astragalus lentiginosus*), and long-haired star tulip (*Calochortus longebarbatus*). Frank Callahan found the latter *Calochortus* as well as *Calochortus nudus* in the Johnson Prairie area at the far west side of the Plateau. That population of *C. longebarbatus* is the most western population known; other populations have been reported south of Beatty and farther east, as well as in northern California. The population of *C. nudus* is the most northern one known (Frank Callahan, pers. comm.); Cal Flora reports it as occurring only in California. The only rare plant we found on our block was green-flowered wild ginger (*Asarum wagneri*), which grows near the Plateau in a small remnant stand of old growth at the BLM's Surveyor Recreation Area on Keno Access Road, and in several other sites between the Pokegama Plateau and Lake of the Woods.

### Conclusion

Now, when I drive Route 66 across the Pokegama Plateau, I see, in my mind's eye, magnificent old growth forests towering above me. How is it that, in less than 100 years, we have obliterated them so completely? What kind of care do we need to exercise in order keep our government honest, our corporations within bounds, and our consumption within limits of sustainability, so that we – and some tall trees – can live in a healthy world?

### Acknowledgements

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At the time Europeans arrived at the Pokegama Plateau, the old growth forest comprised ponderosa pine (50-60%), Douglas fir (25%), sugar pine (15%), and less than 2% each of white fir and incense cedar. Percentages are approximate (Beckham 2006). Photo courtesy of Shaw Historical Library, Alfred Collier Collection, Image Series #1750.

*Country*; Jeff LeLande, author of another excellent book, *First Over the Siskiyou*, and for his thoughts on the original vegetation; Tom Atzet, forest ecologist extraordinaire, for information on forest growth; Frank Callahan for general information of the Pokegama Plateau and for specific information about *Calochortus*, sugar pine, and wild horses; Don and Nancey Begnoche for general encouragement and Don for drawing detailed geologic maps of the area; Ron McIntyre for geologic insights; Chris Sokol, longtime forester on the Plateau for Weyerhaeuser and subsequent owners of those forest lands, for his helpful input even when we disagreed about forestry objectives; Weyerhaeuser archives for useful materials; Anita and John Ward for their support and information about the Friends of the Greenspings; Paul Boos of Cold Creek Ranch on Ager Beswick Road for information about the Pokegama chute; Belinda and Bob Vos for their support and for Bob's fine botanical photographs (Bob's photo of ¼ inch high *Mimulus pygmaeus* fills a screen in perfect focus); Cindy Roché for encouragement and insightful editing, and especially to Julian Battaile, whose curiosity and willingness to spend hours poking about on dusty roads enriched my life so much.

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- Connie Hopkins Battaile is a retired reference librarian who grew up in Waldport, Oregon, where her father was the USFS district ranger. In 1962 she and her late husband, Julian Battaile, moved to Ashland where he taught chemistry at SOU. In more recent years both became involved in the Native Plant Society and Oregon Flora project. Connie is the author of *The Oregon Book: Information A to Z* (1998) and has been a Chautauqua speaker on Oregon history for the Oregon Council of the Humanities. She is also a Hospice volunteer and teaches a class called Final Arrangements.

# Botanist William H. Baker (1911-1985): Captivated by Isolated Floras

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(Adapted from an essay that will appear in *Plant Hunters of the Pacific Northwest*, edited by A. R. Kruckeberg and R. M. Love)

“William Hudson Baker was captivated by the floras of isolated mountain ranges in western Oregon” (Arthur Kruckeberg, pers. comm.). In his graduate work under the direction of Dr. Helen Gilkey at Oregon State University, Baker catalogued the floras of two remote and rugged western Oregon peaks, Fairview Mountain in Lane County and Iron Mountain in Curry County. As a result of this work, Iron Mountain was later designated a Botanical Area in the Siskiyou National Forest. Even after accepting a teaching position at the University of Idaho, Baker continued to be drawn to his birth state, spending several summers as a Park Ranger at Crater Lake as well as three seasons collecting in the Wallowa Mountains. At the University of Idaho, Baker rose from botany instructor and herbarium curator to science administrator before illness forced him to take early retirement. He then chose to live his last years in western Oregon, where he first discovered his love of botany.

Some botanists are known for a major contribution in a particular field, while for others the simple daily routine of teaching, mentoring, collecting, identifying and cataloging, creates, over time, a substantial botanical legacy. William Baker falls in the latter category. Although Baker discovered his botanical calling late (after an initial career in education and wartime military service), and was forced to retire early, he made impressive contributions during the mid-twentieth century to our knowledge of the floras of Oregon and Idaho. Baker left no personal papers or notebooks; therefore this essay pieces together the details of his life from Oregon Flora Project data, academic transcripts, newspaper notices, wartime files, and his published works.

## A Boy from The Dalles

William Hudson Baker was born in Portland on December 14, 1911. He grew up in The Dalles, son of Helen Thornbury (Hudson) Baker of The Dalles, and William Thomas Baker, a railroad contractor. Helen was a member of a prominent Wasco County pioneer family, the T. A. Hudsons. She and Baker were married in her hometown on November 28, 1910, after which the newlyweds set up housekeeping in Portland where Bill was born

a year later (*The Dalles Chronicle* 1910, 1911). When he was about four years old, a second son, Robert, was born. Some time after the birth of the younger boy, Helen Baker returned to The Dalles and subsequently raised her boys alone. The circumstances of her move are not known; in 1948 she described herself as a widow (*The Dalles City Directory*, 1948.) Money was tight; Helen took in boarders and son Bill, during his high school years, worked as a church janitor.



Bill Baker, as a 19-year-old senior at The Dalles High School. Photo in the school's 1931 yearbook, the *Steelhead*.

The future botanist attended The Dalles High School, where he earned the customary credits in English, history, geography, algebra, geometry, chemistry, and biology. Records indicate no particular early interest or aptitude for science; however, in his senior year he joined the glee club and appeared in an operetta (*The Dalles High School Steelhead*, 1931). During the two years after high school he attended Los Angeles Junior College, where he took no science classes and received only mediocre grades. He then apparently decided to prepare himself for a teaching career. Baker was 21 when he enrolled at Oregon Normal School in Monmouth where, in four quarters, he significantly improved his academic record (Oregon State University Archives and Special Collections).

More importantly, while in Monmouth Bill met the young woman who would later become his wife. Molly Ann Cochran, two years

younger than Bill, grew up on a farm north of Eugene, graduated from Coburg High School in 1930, and joined a sorority at Oregon State College, later transferring to the Normal School and the University of Oregon. Molly's stepfather, Wilfred A. Cochran, was a businessman as well as a farmer. Her mother, Kate, was a member of the pioneer Vanduyn family of Lane County. The Cochrans also owned vacation property with a summer house on the Rogue River near Agness and Iron Mountain, which would later influence Baker's choice of botanical study areas. Molly had an excellent educational background for a botanist's companion, having studied Latin, biology, botany, geology, and geography in college.

During the next two years Baker, who was probably now contemplating marriage, became serious about his education. This was a period of deep economic depression in the United States, and he no doubt realized he would soon need to support himself

and a wife. He took classes at Oregon State College in Corvallis, returning to Monmouth Normal to do his practice teaching. He and Molly were married on November 17, 1934; he was 23 and she was 21. The following year he completed his degree in education at Oregon State and accepted a teaching position with the public schools in Burns (Harney County) where he was promoted to Principal in 1939 (*Oregon Education Journal* 1939). (Interestingly, during Baker's years in Oregon, he is not known to have collected a single plant specimen in Harney County.) This chronology brings the young couple into the early years of World War II. We know little of the Bakers' lives at this time except that he described himself as a "Public School Administrator in Oregon," and in 1938 supplemented his income with summer employment at The Dalles Cooperative Fruit Growers. During this period he also began taking summer classes, which precipitated another turning point in his life.



Molly Cochran as a student at Oregon State College, c. 1930. Image of student academic record card, courtesy of Oregon State University Archives and Special Collections.

### His Life's Calling

From transcripts and OSU Herbarium records, I surmise that this was when Baker's interest in botany developed. In the summer of 1937, he studied general and systematic botany at Oregon State, apparently with Dr. Helen Gilkey, who must have awakened his interest in plants. As if recognizing his true purpose in life, Baker now began energetically collecting and identifying plant specimens from throughout Oregon. The OSU Herbarium holds his collections dated between 1937 and 1942 from both east and west of the Cascades (Wasco, Sherman, Wheeler, Gilliam, Jefferson, Klamath, Lane, Lincoln, Douglas, Curry, Benton, and Linn counties). He began collecting ferns at Fairview Mountain in Lane County in 1937 (Baker 1948). In 1939, he took three summer botany courses at the University of Idaho, including advanced taxonomy, and in 1940, he collected at Diamond Lake (Douglas County) with 21-year-old Arthur Cronquist who was then completing his doctorate at the University of Minnesota. From 1936 to 1941 Baker earned graduate credits in science during summer sessions at three northwest schools: the University of Oregon, the University of Idaho, and University of Washington, for a total of six colleges he is known to have attended.

In 1942, Baker resigned from his administrative position in Burns, and returned to Corvallis to work on a Master's degree in education with a minor in biology; his thesis was entitled, "Key to the Flora of Fairview Mountain for Use in Teaching" (Baker 1942). In it Baker combined instructions for student fieldwork in botany with a catalogue of the Fairview flora. His thesis director was R. J. Clinton of the Department of Education. Later, Baker rewrote the botanical material for *American Midland Naturalist* (1951), omitting the teaching aspects. After successfully defending this thesis on May 9, 1942, Bill was awarded his Masters Degree.

### Becoming a Botanist After the War

In the forward to his Masters thesis, Baker thanked his wife Molly for her "...painstaking assistance in checking and proof-reading the manuscript, also, for her companionship on the many field trips which were made to gather materials" (Baker 1942). However, world events now dictated that the two would be apart for several years. Following the attack on Pearl Harbor of December 7, 1941, the United States declared war on Japan and the Axis powers, and in August 1942 (at the age of 31), Baker enlisted in the US Navy and reported for duty in Portland. He received military training at Camp Perry, Virginia, and at Harvard University in Cambridge, Massachusetts, and subsequently served with the Seventh Fleet in the South Pacific in New Guinea, Manila, and Leyte in the Philippines. He was a member of a naval construction battalion whose primary role was carving

Allied airfields out of tropical jungles (National Personnel Records Center). His naval records do not specify when he left the military, however we do know that he was stationed in Melbourne Australia in the fall of 1945, a few months after the Japanese surrender. Baker's whereabouts were mentioned in *The Dalles Chronicle* on October 11, 1945 in an announcement that William and Molly had adopted a newborn baby boy, naming him James William Baker. He was to be their only child.

Baker's military service qualified him for the GI Bill, which helped finance his subsequent work for a PhD in botany at Oregon State University starting in 1946. At this time he was clearly preparing himself for a botanical career, choosing Helen Gilkey as his major professor. OSC Herbarium records indicate that from 1946 through 1948 he botanized heavily at Fairview Mountain in southern Lane County, and at Iron Mountain in Curry County. In his short paper, "Plant Records from Curry County, Oregon" (Baker 1950a), he described a new road that had recently been constructed over the Coquille-Rogue River divide from Powers to Agness that gave him automobile access to an area that had previously been approachable only by boat from Gold Beach over thirty miles away. During



Dr. Helen M. Gilkey (1886-1972), OSC Botany Professor and Herbarium Curator from 1918 to 1951. Photo courtesy of Oregon State University Archives and Special Collections.



Iron Mountain (Curry County) lookout in 1944. Photo courtesy US Forest Service (ROR-SIS SO in Medford, page or photo 75 in Album 11), scanned by Lee Webb. The lookout was constructed 1925 and demolished in 1958.

the 1946-47 academic year, the 35-year-old veteran and new father had a strenuous schedule, researching and writing his PhD thesis, traveling to and from his research sites in southern Lane County and southwest Oregon, and taking courses in advanced systematic botany, plant anatomy, invertebrate zoology, microtechnique, ecology and parasitology. At this time he also published "Ferns of Fairview Mountain, Calapooya Range, Oregon" (Baker 1948). In addition, he was a graduate teaching assistant in botany.

### On to Idaho: "Ten Thousand Odd Plants"

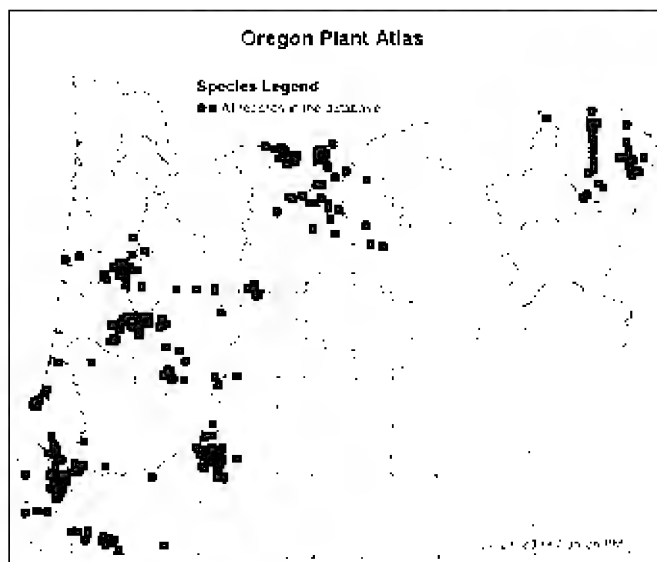
By 1948, Baker was sufficiently well along with his PhD to apply for college teaching positions. Fortunately, the Department of Biological Sciences at the University of Idaho was looking for a botanist with his qualifications and hired him as an Assistant Professor, beginning in the spring of 1949. Baker (now 38), Molly, and Jimmy transferred to Moscow where the family moved into a home at 517 North Garfield Street. In April Baker returned to Corvallis to defend his PhD thesis entitled, "A Taxonomic and Ecologic Comparison of the Floras of Iron and Fairview Mountains in Oregon" (Baker 1949a). In May his family, including his mother and Molly's family attended his graduation ceremony in Corvallis.

Although now living and working in Idaho, Baker remained eager to botanize in his home state; consequently, during the summers of 1949 and 1950 he worked as a Ranger-Naturalist at Crater Lake National Park, taking his family to live with him in the Park. While at Crater Lake he published an account of 16 species either not previously listed for the Park or that warranted discussion in the Park's "Nature Notes" (Baker 1950b). He also sent a number of Crater Lake specimens to the OSC Herbarium.

Back in Moscow in October 1949 he wrote to Helen, "We are all well here... I have 50 students enrolled in grasses, which is more than last year, ... this with one section of General Forest Botany and the responsibility for the weekly seminar programs round out the teaching load. Then there is the Herbarium and the ten thousand odd plants I collected this past season ..." (Baker's correspondence with Dr. Gilkey is archived in the Helen Gilkey files at the OSU Valley Library).

During his doctoral research in 1947 Baker had discovered an unknown species of knotweed at Fairview Mountain. He published it in *Madroño* as *Polygonum cascadenae* with a photo and a line drawing of the new species by his mentor, Helen Gilkey (Baker 1949a). In 1951, Baker published "Plants of Fairview Mountain, Calapooya Range, Oregon," and five years later, "Plants of Iron Mountain, Rogue

River Range, Oregon," both in *American Midland Naturalist* and both illustrated with the author's photographs (Baker 1951, 1956).



William Baker's collection sites (ca. 2,000 records) in Oregon, 1937 to 1954. Baker concentrated his Oregon collecting in southwestern Oregon, and in Wasco, Sherman, and Wallowa counties. (Map courtesy of the Oregon Flora Project.)



In “Plant Records from Curry County, Oregon,” Baker (1950b) provides further details of his botanizing in that county, and the paper on Iron Mountain includes a catalogue of the area’s unusual flora, documenting species said to be at the northern or southern extremes of their ranges, for example, *Picea breweri* from the south and *Erythronium oregonum* from the north. Because of Baker’s work, Iron Mountain was finally designated a Botanical Area in 1989 (Lee Webb, pers. comm.).

During the summers of 1952, 1953, and 1955 Baker studied the flora of the Wallowa Mountains in Oregon and sent duplicate specimens to OSC. It would have been logical for Baker to work on an Idaho Flora, however Ray J. Davis of Idaho State College in Pocatello published his *Flora of Idaho* in 1952. In June of that year, Baker reviewed the new book favorably in the journal *Northwest Science*: “The writer is to be congratulated on the completion of a very excellent account of the flora” (Baker 1952).

In July 1959 Baker described his life in Moscow to Helen Gilkey: “I am teaching this summer and only get into the field on weekends. I have a class of 23 school teachers in Systematic Botany. You can believe me when I say that they keep me very busy... I am planning on continuing my work this summer in the office of Naval Research in San Francisco where I will spend better than two weeks. Jim [now 14 years old] is in Oregon with his [Cochran] grandparents fishing on the Rogue.” (The Bakers had use of the Cochran vacation house and 127 acres on the Rogue River near Illahe, about six miles southeast of Iron Mountain. Baker no doubt used it as a base camp when he did field work for his PhD. The dwelling was washed away in the winter floods of 1964.)



Crater Lake Ranger Staff, 1949. William Baker is in the back row, far left. Courtesy of NPS Crater Lake National Park Museum and Archives. Coll. 8885-4500.

Barbara Rupers, one of his former students in forest botany wrote: “I was the only female enrolled in forestry at the U of I, and systematic botany was a required class. In those dark ages field trips were virtually non-existent. Dr. Baker was my instructor in the spring of 1955. It was one of my favorite classes – I always did like identification – woods, trees, minerals, rocks. His labs were well organized and I really enjoyed them (though it did seem odd that someone in forestry was required to take a class that concentrated on monocots – grasses in particular). The knowledge I gained from



Type specimen of *Polygonum cascadenae* collected by William Baker at Fairview Mountain, Lane County, south slope, 5500 ft., September 28, 1947, no. 5129. Courtesy Oregon State University Herbarium.

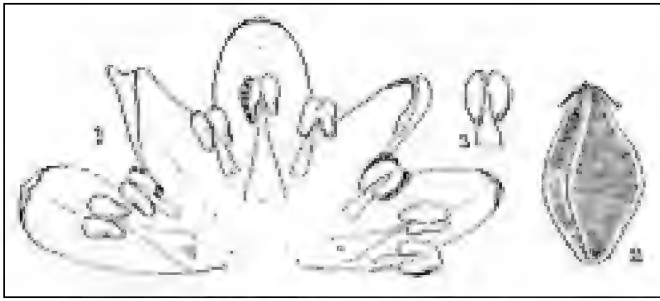
Dr. Baker is helping in the identification of native plants on my property located on Mill and Gooseneck Creeks in Polk County Oregon” (B. Rupers, pers. comm. 2006).

### Academic Life and Advancement

Baker’s career at the University of Idaho spanned 24 years. In 1958 he became a full professor and founded the Idaho Academy of Science, serving as its first president. Later he became Chairman of Botany, and in 1972, Head of the Department of Biological Sciences. In 1960 he was profiled in Volume 1 Number 1 of *The Journal of the Idaho Academy of Sciences* with a photo. Baker’s organizations and affiliations included Phi Sigma, Sigma Xi, Alpha Tau Omega, Moscow Kiwanis Club, Northwest Scientific Association, Botanical Society of America, American Society of Plant Taxonomists, American Fern Society, and International Association of Plant Taxonomists (*American Men and Women of Science* 1960). He was especially active in the Northwest Scientific Association between 1950 and 1972, and is listed in their journal, *Northwest Science*, as an Honorary Life Member of that organization in 1973. His specialties included floristics, plant distributions, flowering plants of Northwest America, weeds, range and wildlife, and food plants of Idaho. He was the lead author of the 1961 book *Wildlife of the Northern Rocky Mountains* (Baker *et al.* 1961). In 1964 he was elected a Fellow of the American Association for the Advancement of Science (U of I *Argonaut*, 9/25/64). Later he became Chairman of Botany, and in 1972, Head of the Department of Biological Sciences. As far as I know, Baker published no articles on the flora of Idaho; however, he is credited with increasing the University of Idaho Herbarium from approximately 8,000 sheets to more than 50,000 specimens (Moscow *Idahonian*, Dec. 20, 1985).

### Going Home: “His Favorite Spot”

Baker’s mother, 84-year-old Helen Baker, died in her hometown, The Dalles, in December 1968. Sadly, four years later, in 1972 at



*Polygonum cascadense*: 1, opened bud with pistil removed; 2, fruit; 3, stamen, dorsal view. Drawings prepared by Baker's mentor, Helen M. Gilkey, for publication of the new species in *Madroño* (Baker 1949a).

the age of 61, Baker began to exhibit symptoms of Parkinson's disease. Due to the physical manifestations of this ailment, he retired early from the University of Idaho and the Bakers returned to Eugene, Oregon, to be closer to Molly's family as well as Bill's younger brother Robert, an Oregon State patrol officer. Bill and Molly bought a house at 2034 Cal Young Road, near the base of Gillespie Butte, north of the Willamette River. To the best of his ability, Baker continued his botanical pursuits, including offering his talents as a botanical consultant. He joined the Native Plant Society of Oregon and attended several of their meetings. As Baker gradually became more handicapped, he employed an attendant who helped him move about in a wheelchair. In the mid-1980s he corresponded with Lee Webb of the Siskiyou National Forest about the unusual flora of Iron Mountain. Webb recalls that at this time, "...his handwriting was very shaky."



William Hudson Baker, Professor of Botany, University of Idaho. Courtesy Philip Anderson, *Idaho Academy of Science Journal*, Number 1, January 1960.

On April 18, 1978, Molly Ann Baker died at the age of 65; she was buried at Gillespie Butte pioneer cemetery in Eugene, amid the graves of her Vanduyn ancestors. Bill and Molly had been married 44 years. In June 1982, with the help of his male nurse-attendant, Bill made a final visit to the site of their former cabin on the Rogue River. He succumbed to the effects of Parkinson's disease on November 22, 1985, just short of his 74<sup>th</sup> birthday, and was buried next to his wife. The obituary in the Moscow newspaper on December 20 quoted University of Idaho botanist Douglass Henderson: "His [Baker's] collections represented much of Idaho and quite a bit of western Oregon, apparently his favorite spot" (*Idahonian* Dec. 20, 1985). Son James did not live with his parents in Eugene, but inherited their house and lived in it for several years before selling it. His whereabouts today are unknown.

In 1986 the Idaho Academy of Science established the William Baker Memorial Award for student presentations at annual meetings; it has been presented annually since 1987. In 2008, their 50<sup>th</sup> anniversary year, the Academy issued a special publication to honor its founder, W. H. Baker.

William Hudson Baker was a devotee of Oregon plants for over 50 years. In the quarter century that he spent at the University of Idaho, he increased the size of its herbarium by over six-fold, while carrying a full academic load and advancing into administration. His contemporary, Arthur Kruckeberg, noted his strengths: "Baker was captivated by the floras of isolated mountain ranges in southwestern Oregon; his Masters and PhD theses both reflect this interest. His botanical output over his life was substantial. His thousands of collected specimens are to be found in a number of herbaria in the Pacific Northwest. Baker's move back to Oregon upon retirement brought him full circle to his beginnings." Clearly, Oregon was Baker's "favorite spot."

### Acknowledgements

I wish to express my sincere appreciation to the following for their assistance with this research; without their valuable help this essay could not have been written. Thank you all: Arthur R. Kruckeberg, Philip A. Anderson, Stephen Dow Beckham, Sheila Dooley, Lorna Elliott, Anar Imin, Steve Mark, Elizabeth Nielsen, John R. Jablonski, Judith Manning, Barbara Rupers, Veva Stansell, Helen Planeto, Lee Webb, William Baker (no relation), Linda Hardison and the Oregon Flora Project staff, Alice Richter, Kay Mattison, The Oregon Genealogical Society, University of Oregon Libraries, Lois Taylor, Petrina White, Julie Monroe, Kenton L. Chambers, Glen Love, Charlene Simpson, Mary Bowen, Berna Croco, Alice Richter, Frank Lang, and Susan Kephart. I dedicate this essay to the Ken and Linda Steigers family of Julietta, Idaho, who helped me in countless ways with this biography as well as with my earlier work on the life of Louis F. Henderson.

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## Book Reviews

### ***Field Guide to the Sedges of the Pacific Northwest***

Wilson, B.L., R.E. Brainerd, D. Lytjen, B. Newhouse, and N. Otting. 2008. Corvallis (OR): Oregon State University Press. 431 p. ISBN 978-0-87071-197-8 \$35.00

Few plant groups strike greater fear into the hearts of amateur (or even professional) botanists than graminoids, especially sedges. (Admittedly, willows and some composites run a close second.) Help with Oregon sedges arrived last summer and as a bonus, the book includes Washington as well. The five botanists who created the *Field Guide to Sedges of the Pacific Northwest* are known formally as the Carex Working Group and informally as the "Sedgeheads." Their collective wit and wisdom about the genus *Carex* has resulted in an excellent book that takes much of the pain, misery and uncertainty out of sedge identification (except, perhaps, among the "dreaded ovals").

The Guide begins with a general discussion of *Carex* ecology, ethnobotany, morphology, nomenclature and classification. Morphology is clarified in the section, "Sedge Parts," using Jean Janish's pen and ink illustrations of "sedge anatomy" (reprinted from Volume 1 of *Vascular Plants of the Pacific Northwest*). Preceding the key to 153 species is a "how to use it" section with pointers for negotiating a long, complicated dichotomous key.

The species accounts are conveniently arranged in alphabetical order by scientific name. There are two pages for each species, one page of text with a distribution map and a facing page of remarkable color photographs and line drawings that illustrate various characteristics, either of the plant or its habitat.

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section within the genus, and which keys you might have used for identification. Next is a list of key features, a complete description, habitat and distribution, identification tips, and comments. Tips for identification discuss look-a-like species and comments include ethnobotanical notes, impacts of grazing, ecological importance.

Facing the text are close-up color photographs: perigynia with a millimeter scale, the scale-like structures that subtend the perigynia; the inflorescence, a habit drawing or photograph (rarely an herbarium specimen) and a habitat photograph.

Discussions of Excluded, Extirpated, and Not (Yet?) Discovered Species, Sedges with Distinctive Traits and Habitats, Collecting Sedges, and Ethnobotanical Uses prove that this tome emanated from years of passionate immersion in the world of sedges. The 26 lists of sedges with distinctive traits or habitats are a wonderful gift to incorrigible folks who always try to circumvent methodically working their way through dichotomous keys. There are lists for plants with hairy leaves, "gigantic" or hairy perigynia, and any number of unusual traits. Plus, there are lists for sedges from specific habitats, such as serpentine fens. And, when you get to the end, there is a comprehensive index, for that time you forgot the scientific name of Wonder Woman Sedge and want to look it up!

This 6- by 9-inch book will fit in any backpack, but might be a bit heavy for some as a field manual. Go to [www.carexworkinggroup.com/index.html](http://www.carexworkinggroup.com/index.html) for updates, corrections, or to add your own suggestions observation or corrections.

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Rhoda M. Love, a long time member of NPSO, became an NPSO Fellow in 2001. She has served as a member of the *Kalmiopsis* editorial board since its inception in 1991, has published biographical articles on Northwest botanists Ken Chambers, Louis Henderson, W.N. Suksdorf, A.R. Sweetser, Lilla Leach, and Lincoln Constance. This is her sixth article in *Kalmiopsis*; she also edited the late Robert Ornduff's article on Thomas Jefferson Howell and contributed sidebars to several articles. She is currently working on a book with Art Kruckeberg, *Plant Hunters of the Pacific Northwest*.

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## Book Reviews

### ***Field Guide to the Sedges of the Pacific Northwest***

Wilson, B.L., R.E. Brainerd, D. Lytjen, B. Newhouse, and N. Otting. 2008. Corvallis (OR): Oregon State University Press. 431 p. ISBN 978-0-87071-197-8 \$35.00

Few plant groups strike greater fear into the hearts of amateur (or even professional) botanists than graminoids, especially sedges. (Admittedly, willows and some composites run a close second.) Help with Oregon sedges arrived last summer and as a bonus, the book includes Washington as well. The five botanists who created the *Field Guide to Sedges of the Pacific Northwest* are known formally as the Carex Working Group and informally as the "Sedgeheads." Their collective wit and wisdom about the genus *Carex* has resulted in an excellent book that takes much of the pain, misery and uncertainty out of sedge identification (except, perhaps, among the "dreaded ovals").

The Guide begins with a general discussion of *Carex* ecology, ethnobotany, morphology, nomenclature and classification. Morphology is clarified in the section, "Sedge Parts," using Jean Janish's pen and ink illustrations of "sedge anatomy" (reprinted from Volume 1 of *Vascular Plants of the Pacific Northwest*). Preceding the key to 153 species is a "how to use it" section with pointers for negotiating a long, complicated dichotomous key.

The species accounts are conveniently arranged in alphabetical order by scientific name. There are two pages for each species, one page of text with a distribution map and a facing page of remarkable color photographs and line drawings that illustrate various characteristics, either of the plant or its habitat.

The text page begins with scientific and common name,

section within the genus, and which keys you might have used for identification. Next is a list of key features, a complete description, habitat and distribution, identification tips, and comments. Tips for identification discuss look-a-like species and comments include ethnobotanical notes, impacts of grazing, ecological importance.

Facing the text are close-up color photographs: perigynia with a millimeter scale, the scale-like structures that subtend the perigynia; the inflorescence, a habit drawing or photograph (rarely an herbarium specimen) and a habitat photograph.

Discussions of Excluded, Extirpated, and Not (Yet?) Discovered Species, Sedges with Distinctive Traits and Habitats, Collecting Sedges, and Ethnobotanical Uses prove that this tome emanated from years of passionate immersion in the world of sedges. The 26 lists of sedges with distinctive traits or habitats are a wonderful gift to incorrigible folks who always try to circumvent methodically working their way through dichotomous keys. There are lists for plants with hairy leaves, "gigantic" or hairy perigynia, and any number of unusual traits. Plus, there are lists for sedges from specific habitats, such as serpentine fens. And, when you get to the end, there is a comprehensive index, for that time you forgot the scientific name of Wonder Woman Sedge and want to look it up!

This 6- by 9-inch book will fit in any backpack, but might be a bit heavy for some as a field manual. Go to [www.carexworkinggroup.com/index.html](http://www.carexworkinggroup.com/index.html) for updates, corrections, or to add your own suggestions observation or corrections.

The book compares favorably with the *Field Guide to Intermountain Sedges* (EG Hurd, NL Shaw, J Mastrogiuseppe, LC Smithman and S Goodrich 1998, USDA Forest Service Gen Tech Report RMRS-GTR-10). The formats are somewhat similar and



many of the same species are covered. The addition of distribution maps and field photos of habit and habitat are a definite step up. Although some of the close-up images in Intermountain Sedges are superior, it lacks the field perspective. If you've ever attended a sedge workshop with the Carex Working Group, the only thing you'll miss in this book are the wonderful regional keys. After using those, it is difficult to go back to a state-wide key. At any rate, this book's comprehensive coverage of the sedges takes us one step closer to an Oregon Flora.

Our experience identifying sedges using the Sedges of the Pacific Northwest keys were mostly positive and successful, although members of the "dreaded" Ovales group still gave cause for head scratching, but not hair pulling. To use this sedge key (or any other) with maximum ease be sure to have plenty of unmounted material that you are not worried about tearing apart. Look for rhizomes when collecting and include them when taking specimens. Also, if your sedge specimen is immature, follow the advice of the Sedgeheads and throw it over your shoulder (don't try to key it).

—Frank A. Lang and Cindy Roché, *Siskiyou Chapter*

### ***Flowers of the Table Rocks***

MacKinnon, S.K. 2007. Medford (OR): author published. 433 p. ISBN 978-0-9814590-0-4 \$36.95 [Available from [tablerockbook@charter.net](mailto:tablerockbook@charter.net)]

Like most wildflower enthusiasts, I can't pass a bookstore without stopping and checking out the nature shelves for the latest field guides on wildflowers. When traveling, I often look for field guides that are specific to that area. Although I like to browse the shelves, I don't usually buy wildflower picture books because more often than not they feature only the most common, showy species and are poorly organized with low quality photographs. Typically, they must be used alongside a flora because the keys (if present) lack so many taxa. As you can see, I'm highly selective in my book purchases and don't clutter my bookshelves with every new book that comes along!

However, I recently discovered the "the perfect wildflower field guide" for the Medford area: *Flowers of the Table Rocks*. You don't need a PhD to use it, either. An amateur botanist herself, the author presents the details she had to learn to identify plants, so the book contains the information about plant anatomy that most PhD botanists hold between their ears. This book could be used as text to help any amateur flower lover become a better botanist.

This 443-page self published guide "for the amateur botanist and the wildflower enthusiast" contains stunning, sharp photographs, an easy-to-use key to families, botanical descriptions with accompanying photomicrographs, detailed information on habitat and plant physiology, and a wealth of information about the Table Rocks.

The Table Rocks, the two prominent geologic structures just north of Medford, are an extremely popular destination for local residents. They are home to more than fifty plant families comprising over 300 species, 85 percent of which are natives. Thus, the book serves as a guide for low elevation habitats in much of Jackson and Josephine counties. Using the simple key, one can quickly move into a family (the book is organized by plant families) and then into those species that occur on the Table Rocks.

Unlike most field guides that offer a single picture per plant, this book features multiple photographs (some through a dissecting microscope) of each species that clearly show distinctive floral parts, buds, leaves, and fruits. Many of the photos include measurements of scale and key plant characteristics are labeled. And, for those looking for the unusual telltale characteristic, this book even offers an odor test for some species.

The author has included tables showing month of flowering for each species as well as a table listing common names and the meanings and derivations of scientific names. She also indicates taxa listed by state and federal agencies as rare and endangered, as well as those that are noxious weed species.

The spring flora of the Table Rocks is the primary draw for thousands of visitors every year. Whether it is your first Table Rock hike or you are a regular visitor, this book is a "must have" for easily identifying every plant you find there. But the other benefit that puts this book a notch above any other is the knowledge you can gain about plant morphological characteristics and terminology used in keying. In short, if you want to learn more about botany while identifying plants, this is the book for you.

—Bob Korfhage, *Siskiyou Chapter*

### ***The Bristlecone Book***

Lanner, R.M. 2007. Missoula (MT): Mountain Press Publishing Co. 117 p. paper. ISBN 978-0-87842-538-9 \$12.00

Ron Lanner, after a career as a research forester and teaching tree biology, is sharing his love of trees, especially coniferous trees, by writing natural history books that interpret science for general readers. The latest is his bristlecone book that gives the life story of "three cousins" of Foxtail Pines (subsection Balfourianae of the genus *Pinus*). *Kalmiopsis* readers learned about *Pinus balfouriana* three years ago in Frank Lang's article about John Jeffrey. Foxtail pine was named for Professor John Balfour, who helped bankroll Jeffrey's explorations. Bristlecone pine achieved fame in 1958 when Edmund Schulman "christened it the world's oldest known living thing" in the National Geographic Magazine. At that time only one species of bristlecone pine was recognized: *P. aristata*. In 1970, Dana K. Bailey gave compelling reasons that the famous, long-lived Great Basin bristlecone pine differed enough from the Rocky Mountain bristlecone pine (*Pinus aristata*) to be given its own name. He named it *Pinus longaeva* to honor its longevity. Dana realized that the differences merited a new species when he was on the US Forest Service Interpretive Trail to the ancient stand of bristlecone pine below Wheeler Peak, Nevada (in 1986 it became Great Basin National Park). For this reason, we call this trail to the ancient Bristlecone Grove, The Discovery Trail, in Dana's honor.

Lanner has done a nice job of compiling everything he knows about the three pines and weaving it into an entertaining story. The illustrations, both color photos and line drawings, are a perfect complement to the narrative. I like his sense of humor as well. For example, when telling us how *Pinus aristata* was named in 1862, he described Dr. George Engelmann as a "mad-about-conifers St. Louis physician who was influential in making western American conifers known to science while anxious patients languished in his waiting room." While it may not be true, it's fun to imagine.

The bristlecone pines range across the highest peaks of the

Intermountain West into California. Lanner includes a description of the single location of foxtail pine in Oregon, on Arnold Peak (reported by Frank Callahan, but now extirpated). Southern Oregon NPSO chapters routinely visit localities in northern California where foxtail pine grows: the Scott, Marble, Salmon, Trinity, Yolla Bolly mountains and the Trinity Alps.

This is a perfect little book to carry on a vacation to read in the campsite or at the top of the peak when pausing for some relaxation. It can heighten your appreciation for the natural environment and satisfy your curiosity about trees we see only near the tops of the mountains.

—Ron Mastrogiuseppe, *Klamath Chapter*

### ***Biology and Evolution of Ferns and Lycopytes***

Ranker J.D., and C.H. Haufler, eds. 2008. Cambridge University Press. 480 pp. \$135.00 hardback, \$63.00 paper.

This book is the latest word on the biology and evolution of ferns and club-mosses from fern experts around the world. The editors and their contributors represent a “Who’s who” of fern scientists today. The editors divide the subject into four parts: Development and Morphogenesis, Genetics and Reproduction, Ecology and Systematics. Each part is divided into chapters that are written by recognized experts in the field. Some chapters have a single author; others, multiple authors. The first thing I did was to see if my PhD research on the evolution of the *Polypodium vulgare* complex was included. I looked, and there it was, neatly summarized on page 309 in Haufler’s chapter on Species and Speciation. This book is not for beginners, although it might be a place to do selective reading about the ecomorphology of fern gametophytes or the biological and evolutionary implications of the antheridiogen system. However, it is a book that every serious fern researcher should own, if only for the book’s extensive bibliography and comprehensive presentation of modern fern research. If you can’t afford the book, make sure your library buys a copy to be available to all readers, beginners even. —Frank Lang, *Siskiyou Chapter*

### ***Mabberley’s Plant-Book: A Portable Dictionary of Plants, their Classification and Uses***

Mabberley, D.J. 2008. 3rd Ed. Cambridge University Press. 1021 p. ISBN-13-9780521820714 \$85.35, hard cover.

I must have been in graduate school when I discovered J.C. Willis’ *A Dictionary of the Flowering Plants and Ferns*. I found it a remarkable compendium of information about vascular plants: their characteristics, classification, and uses (ethnobotany). Willis, and later H. K. Airy Shaw, put the dictionary through a series of editions, and each one included more and more plant information.

In 1987, D. J. Mabberley of Cambridge University took the dictionary to new heights with the publication of *The Plant-Book: A Portable Dictionary of Vascular Plants* with a second edition ten years later. In 2008, a third edition is available, with a new title Mabberley’s *Plant-Book: A Portable Dictionary of Plants, their Classification and Uses* and an additional 1,650 or so new entries.

The title change from “Vascular Plants” to just plain “Plants” reflects the addition of ecologically and economically important

moss genera, including, for example, *Sphagnum*. As in any dictionary, entries are in alphabetical order by genus, family, well-known common name, or botanical term, which might also be a common name (nut, for example).

Mabberley uses a modern approach to classification and nomenclature. He generally follows Kubitzki’s *The Families and Genera of Vascular Plants* with modifications to take into account new information from molecular studies. Do not be surprised at new names for old groups or old names for new groups. He recommends the use of Labiales, Compositae, etc. over their newer names Lamiaceae, Asteraceae. On the other hand, *Trillium* is placed in the Melanthiaceae and not the Trilliaceae or the Liliaceae as most of you learned. Melanthiaceae is also where you will find *Veratrum* and *Xerophyllum*.

The book is an odd shape 5 x 9 x 1.75 inches (12.5 x 23.5 x 4.5 cm), hard bound, and has a nice dark blue ribbon for keeping your place, but small enough to be “portable.” Font size is small (you do have a hand lens, right?) and printed on 1021, thin, quality paper pages. Understanding the abbreviations will take a while. If the book had a flexible cover, I would call it a botanical bible. The high price is worth every penny if you want to have maximum botanical information on your shelf in a single book. I use my copy frequently. —Frank Lang, *Siskiyou Chapter*

### ***Field Guide to Shrubs of Southwestern Oregon***

Bennett, M. and J. Walker. 2008. Corvallis (OR): OSU Extension Service and Middle Rogue Watershed Council. 80 p. spiral bound, 5 x 7 inches; \$7. [Available from OSU Extension office at 569 Hanley Road, Central Point (776-7371) or 215 Ringuette, Grants Pass (476-6613) or from the Middle Rogue Watershed Council, 543 NW “E” St., Ste. 201, Grants Pass, OR 97526; mrwc@charterinternet.com]

Like the *Field Guide to Sedges*, this shrub guide was conceived by a group of individuals with common interests. The “Shrub Club,” a group working with landowners and agencies on watershed and small woodland projects, needed a field guide for shrubs in southwestern Oregon. So they created one, or perhaps they assigned the task to two of their members. Max Bennett, OSU Extension Service Forester, took the lead on writing the text and Jan Walker has first credit on the photos.

The guide primarily covers common native shrubs, but includes three important invaders: our two “wild, non-native” blackberries and Scotch broom. The 56 entries are presented in alphabetical order by scientific name. There also is an index in the back of the booklet organized alphabetically by common name. The index isn’t entirely consistent (for example, Himalayan blackberry is listed under “b” and Scotch broom is listed under “s”). Luckily, the list is short enough that the reader can quickly scan both pages to find the desired entry.

In the introductory pages we learn that a shrub is a woody plant less than 20 feet tall at maturity, with several trunks. The guide excludes trees that sometimes grow as shrubs, such as canyon live oak and includes some woody vines (which don’t exactly fit the previous definition). The intended coverage is the Klamath Mountains Ecoregion, which is shown on a map on page 5, followed by a two page illustrated glossary of plant parts and several pages of simple keys presented like “organizational charts” (lines and boxes).

Two or three color photos of each shrub show different stages of development and parts of the plant: catkins or flowers, leaves, twigs, bark, thorns, fruits, plant habit. Below the photos, the authors tell the relative size at maturity and the type of habitat (e.g., chaparral, coniferous forest), followed by descriptions of its leaves, twigs, flowers, and fruit, and some notable trait often dealing with horticultural possibilities, uses by humans or wildlife, or similar species not covered in detail.

If you expect the guide to be comprehensive, you will be disappointed by the number of native shrubs that fail to appear in its pages. Botanically savvy readers might prefer to have plant families listed, or that the gooseberry, rose and willow species be dealt with individually, rather than lumped (e.g., *Salix* spp.). That aside, this is a great little field guide; easy to use, good photos, fits in your pocket or pack, and includes most of the common shrubs in southwestern Oregon. In addition, it could serve as a reference for learning about native shrubs for landscaping.

—Cindy Roché, *Siskiyou Chapter*

### ***Plain Green Wrapper: A Forester's Story***

McCormick, R.J. 2009. \$19.95 ISBN: 978-0-578-02601-5

Self Published. Available from [lulu.com](http://lulu.com)

In *Plain Green Wrapper*, Ron McCormick chronicled his life in the Forest Service for two audiences: his personal family and his Forest Service “family.” For the former, he hoped to give his children and grandchildren a better understanding of his life, and for the latter, to contribute to a national museum of US Forest Service history. He is successful in both of those endeavors, and in a third one as well: giving insight into the difficulties public land resource managers face in finding a balance between opposing factions, and the frustration of seeing one’s hard work negated by swings of the political pendulum. Rather than becoming bitter, he has come up with a model that would serve, to some degree, to buffer resource management decisions from short-term political extremes.

This personal story tells how a boy from a small town in Ohio discovered that he loved the outdoors and pursued a career with the Forest Service, which culminated as Supervisor of the Siskiyou National Forest in southwestern Oregon. Perhaps only a small percentage of boys in the 1940s who loved to hunt and fish ended up in the Forest Service, but a high percentage of the foresters in the 60s and 70s had been boys who loved the outdoors. His experiences were in many ways typical of his generation of foresters, so his story will resonate particularly with readers who are or have been Forest Service employees (CR). The book is not great literature; errors in grammar and awkward sentences abound. But “outdoor boys” have rarely been polished writers, and his writing is clearly from the heart, revealing the integrity and courage of the author.

McCormick recounts the trials and tribulations of a forester who tried to find the middle way between rigid environmentalists out to save every single tree and a vindictive timber industry out to cut every tree, standing or not, down or up for green timber or salvage. The chronicle is both personal and professional: two marriages, children, schooling, employment, moving from position to position on seven National Forests, projects, successes, and setbacks.

His account of developing consensus for the management of \$8 Mountain in Josephine County was of particular interest to one of

us (FL) who was involved in the process mentioned as “an eminent professor of botany from Southern Oregon University,” as a field trip leader there. The field trip, in McCormick’s view, was important in developing a common knowledge base, appreciating the resource, understanding the issues, discovering common values and fostering mutual respect among members of the group. Consensus was greatly facilitated by McCormick’s hiring Bob Chadwick to guide the disparate group. It was a pleasure to be reminded of Chadwick’s consensus building techniques and gentle ways.

The stories paralleled what many public agency employees experienced, particularly in attempting to get a broader approach to managing ecosystems. I (TA) particularly enjoyed the last part of the book where he writes about where we should be and how we should get there. At a meeting in Grants Pass years ago, he introduced his idea for a Federal Public Land and Resources Board, similar to the Federal Reserve, to act as a shield between the Forest Service and the short-term thinking of the current congress and administration. His approach of inclusion was necessary, but not sufficient. When courts decide, management is based on politics rather than science. Perhaps this Board could pull together science and public demands in a productive rather than a destructive way.

—Cindy Roché, *Frank Lang and Tom Atzet, Siskiyou Chapter*

### ***Williams Area Trail Guide***

Roether, E. 2006. Williams (OR): author published. 64 p. spiral bound. ISBN 0-9779727-0-4 \$12.00 [Available at Williams General Store, Oregon Books in Grants Pass, and Northwest Nature Shop in Ashland]

In southwestern Oregon, hiking is a year-round activity; we select the area and elevation depending on the season. Based on a tip offered by David Wagner on the NPSO listserve last spring, Bob and I hiked the Enchanted Forest trail. The wildflowers were out, but not many hikers; not until we reached the upper end of the trail did we encounter other people. There we met Evelyn Roether with her friends, and she told us about the trail guide for the Williams area that she had published.

The first fourteen pages of the guide briefly describe the Williams Creek watershed, land ownership, geology, climate, plants, animals, first people, fur trade, gold mining, logging, and current residents. Two pages are devoted to a list of the featured trails and a vicinity map showing their locations. The heart of the book features descriptions of fifteen trails. There is a hand-drawn map showing the trail and major topographical features, followed by a difficulty rating, distance, elevation gain, accessibility season, name of the USGS quad map, and a narrative about the trail. At 5½ by 8½ inches, it fits easily into a daypack.

Some of these trails are featured in other guidebooks, but because Evelyn focuses on such a small region, she includes trails that no one else does. This is a great little book to inspire you to get outside and explore the terrain “out in our backyard.”

—Cindy Roché, *Siskiyou Chapter*

### Frank Callahan

When Frank Callahan was an impressionable lad of ten his grandfather Walter LaMinter told him: "You are from a long line of pioneers, you need to go out and make discoveries." Fortunately Frank took his grandfather's advice and applied it to the plant world with a keen eye for seeing what others have overlooked. He is a leading nominator of National Champion Trees, having reported the largest individual tree for more than 80 species. He has discovered locations in Oregon for 35 species of native plants not formerly known in the state, mostly northern extensions of the California floristic province (see list on the NPSO website). With no formal botanical education, he has described two new species of *Calochortus*: *C. syntrophus* alone and *C. coxii* with Ray Godfrey. He is currently working on six as yet undescribed new taxa, three each in Oregon and California: *Calochortus umpquaensis* ssp. *confertus* (ined.), *Calochortus elegans* var. *crinisordinate* (ined.), *Chlorogalum pomeridianum* ssp. *austro-oreganus* (ined.), (in Oregon), *Calochortus tetrastriatus* (ined.), *Calochortus argillosus* ssp. *maritimus* (ined.), *Calochortus argillosus* ssp. *mutabilis* (ined.) (California). Frank credits his mother, Muriel LaMinter Callahan, who has a professional degree in horticulture, with his early introduction to the plant world. With this background, he is self-taught, driven by an insatiable curiosity about all things botanical. In this way, Frank resembles a modern Thomas Howell, discovering and describing new species without funding and without an academic framework.

Franklin Theodore Callahan II was born in Bend, Oregon, on March 19, 1947 to Muriel and Frank T. Callahan. He attended St Francis of Assisi school in Bend, but as a born naturalist, had trouble fitting in with Catholic theology. His saving grace through those years was his artistic talent, which he shared by teaching other students. As a teenager, he developed a penchant for exploring, going on long hikes with his German shepherd, Jack. While hiking at Wake Butte (near Camp Abbot, now Sunriver), he discovered unusual plants that grew only on welded tuffs. Dr. Gettman, a teacher at Bend High School, became his mentor and encouraged botanical collecting trips to Mt. Bachelor, Broken Top and Tam McCarthur Rim in the Cascades west of Bend. Many years later Frank finally identified a specimen of Washoe pine growing with whitebark pines on Tam McCarthur Rim.

Just before his senior year, his family moved to Charleston on the Oregon coast. Frank graduated from Marshfield High School in Coos Bay in 1965 and joined his family who, disappointed with the dank coastal climate, had moved to Central Point. He purchased a copy of Peck's *Manual of the Higher Plants of Oregon*, and began learning the local flora. Shortly after this, his botanizing took a (military) tropical detour, with 13 months in South Vietnam and a year and a half in Hawai'i. When he returned to Central Point, he began taking classes at Southern Oregon College (SOC, now Southern Oregon University, Ashland) in 1967 on the G.I. bill, majoring in Graphic Design, with the idea of becoming a teacher. He purchased a piece of property between Central Point and Gold Hill, and worked full

time at Cascade Wood Products doing millwork. During his time at SOC, he "pestered Frank Lang with numerous botanical questions," but did not take a course in botany. He left college after two and a half years, when he reached his limit of living on four hours of sleep a day while meeting the demands of classes and working full time.



He has botanized extensively in California, made ten expeditions into Mexico, and amassed a personal herbarium of over 3,000 sheets associated with his native seed business. He is presently transferring his herbarium to the Oregon State University Herbarium. He wrote the *Calochortus* chapter for the *Bulbs of North America* published by Timber Press and furnished some of the photographs. He appeared in botanical documentaries with Martha Stewart (Martha Stewart Living), Ed Bagley, Jr. (Bigfoot Country) and "American Forest National Champion Trees" for PBS. He teaches a course in native conifer identification at the Siskiyou Field Institute each summer.

Frank is a member of the Siskiyou Chapter of NPSO and the California Native Plant Society. He and his wife Karen live in the botanically rich foothills between Central Point and Gold Hill and have two grown children, Katie and Forrest. At age six, Forrest's son Leo started hiking to the tops of mountains with his father and grandfather, and now helps his grandfather with plant collections.

After 27 years of mill work, and a detour into minerals and geology with the Crater Rock Museum, Frank now devotes his time to managing his native tree and shrub seed business. Callahan Seeds was started in 1977, offering seeds of western North American trees and shrubs. For many years he offered seeds from Asiatic, European, South American, Australian and New Zealand seed sources. However, recent importation and inspection fees have limited his seed stock to domestic sources. Because most of the world uses the metric system, seeds are sold in 25 gram packets up to kilogram amounts. His seed list includes about 478 species of seeds, including everything from *Abies* (true firs) to *Xylococcus bicolor* (Mission manzanita). He does not offer grass or wildflower seeds. Most seeds are wild collected with provenance information provided. He says that seed collecting usually leads to discoveries of range extensions for other species.

Offspring from Frank's seed collections grow in major arboreta in the western US and around the world. Some of the plantings are now mature and producing seed. Bringing our plants to the world stage for all to enjoy is one of Frank's major contributions to plant lovers everywhere. He is a modern David Douglas in that regard.

He consults as a field botanist for the US Forest Service and Bureau of Land Management. His particular botanical interests range from trees (both conifers and angiosperms) to geophytes (bulb or corm-forming taxa including *Calochortus*, *Chlorogalum*, *Dichelostemma*, *Brodiaea*, *Fritillaria*, *Erythronium*, and *Triteleia*). Frank's eye for discovering new locations and new species stems from his understanding of geology, habitats, attention to detail, innate curiosity, and an attitude that "botanical exploration is far from finished in Oregon!" — Cindy Roché, Siskiyou Chapter